Daniel R. Pimentel

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Research and Teaching Interests

Teacher education, science teaching and learning, curriculum development, scientific literacy, science media literacy, online reasoning, data literacy, epistemic cognition, nature of science, science studies, qualitative and mixed methods

Education

Ph.D. **Stanford University**, Stanford, CA — 2023

Curriculum Studies and Teacher Education: Science Education, Learning Sciences and Technology Design, Education Data Science

Dissertation Title: *Learning to Evaluate Sources of Science (Mis)Information: A Mixed Methods Study of High School Students' Scientific Online Reasoning*
Committee: Janet Carlson, Bryan Brown, Jonathan Osborne, & Victor Lee

M.Ed. **Boston College**, Chestnut Hill, MA — 2014

Secondary Education: Biology

B.S. **Boston College**, Chestnut Hill, MA — 2013

Biology (Minor: Music)

Academic Appointments

The University of Alabama, Tuscaloosa, AL — 2023 - present

Assistant Professor of Science Education
Department of Curriculum and Instruction

Affiliations

The University of Alabama, Tuscaloosa, AL — 2023 - present
Faculty Affiliate, Alabama Science Communication Initiative
College of Communication & Information Sciences

Simon Frasier University, Burnaby, British Columbia — 2023 - present
Research Affiliate, Public Knowledge Project

Certificates

Stanford University, Stanford, CA — 2021
Graduate Certificate in Science, Technology, and Society
Concentration: Data and Society

Relay Graduate School of Education, New York, NY — 2016
Advanced Certificate in Special Education

Publications | * indicates that all authors contributed equally to the publication

Refereed Journal Articles

Pimentel, D.R. (conditionally accepted). Learning to evaluate science (mis)information on the internet: Assessing students' scientific online reasoning.

Wilsey, M., Brown, B., & **Pimentel, D.R.** (under revision). Assessment for learning: An exploration into how formative assessments can be designed for elementary student science learning and sensemaking.

Willinsky, J. & **Pimentel, D.R.** (2024). The publication facts label: A public and professional guide for research articles. *Learned Publishing*. Available online: https://doi.org/10.1002/leap.1599

Osborne, J., & **Pimentel, D.R.** (2023). Science education in an age of misinformation. *Science Education.* https://doi.org/10.1002/sce.21790

Stovall, J.L., **Pimentel, D.R.**, Levine, S., & Carlson, J.C. (2023). High school mathematics teachers' noticing of inequitable talk. *Journal of Mathematics Teacher Education.* https://doi.org/10.1007/s10857-023-09572-9

Osborne, J., & **Pimentel, D.R.** (2022). Science, misinformation, and the role of education. *Science, 378*(6617), 246-248. https://doi.org/10.1126/science.abq8093

Lee, V. R., **Pimentel, D. R.**, Bhargava, R., & D'Ignazio, C. (2022). Taking data feminism to school: A synthesis and review of pre-collegiate data science education projects. *British Journal of Educational Technology*, *53*(5), 1096– 1113. https://doi.org/10.1111/bjet.13251

Reynante, B. M.*, Selbach-Allen, M. E.*, & **Pimentel, D. R.*** (2020). Exploring the promises and perils of integrated STEM through disciplinary practices and epistemologies. *Science & Education*, *29,* 785-803. https://doi.org/10.1007/s11191-020-00121-x

Pace, N. J., **Pimentel, D. R.** & Weerapana, E. (2012). An inhibitor of Glutathione S-Transferase Omega 1 that selectively targets apoptotic cells. *Angewandte Chemie International Edition*, *51*(33), 8365-8368. https://doi.org/10.1002/anie.201203730

Research Reports

Pimentel, D. R., Horton, N. & Wilkerson, M. H. (2022). *Tools to support data analysis and data science in K-12 education*. Commissioned Paper for the National Academies of Sciences, Engineering, and Medicine, Board on Science Education, Workshop on Foundations of Data Science for Students in Grades K-12. Washington, D.C.

Osborne, J., **Pimentel, D.R.**, Alberts, B., Allchin, D., Barzilai, S., Bergstrom, C., Coffey, J., Donovan, B., Dorph, R., Kivinen, K., Kozyreva. A., Perkins, K., Perlmutter S., Wineburg, S. (2022). *Science education in an age of misinformation*. Stanford University, Stanford, CA.

Book Chapters

Pea, R., Biernacki, P., Bigman, M, Boles, K., Coelho, R., Docherty, V., Garcia, J., Lin, V., Nguyen, J., **Pimentel, D.**, Pozos, R., Reynante, B., Roy, E., Southerton, E., Suzara, M., Vishwanath, A. (2022). Four surveillance technologies and challenges for education. In Niemi, H., Pea, R., & Lu, Y. (2022). (Eds.). *AI in Learning: Designing the Future*. Springer Nature.

White Papers

Osborne, J., Zucker, A.,Pimentel, D. R. (2023). Tackling Scientific Misinformation in Science Education. Available online: https://sciedandmisinfo.stanford.edu/sites/g/files/sbiybj25316/files/media/file/tackling_misinformation_in_science_education_osborne_zucker_pimentel.pdf

Practitioner Journals

Pimentel, D.R., & Osborne, J. (2023). Science education in an age of misinformation. *California Classroom Science, 35*(3). https://classroomscience.org/articles/fyi/science-education-age-misinformation

Popular Press

Bergstrom C.T., **Pimentel, D.R.**, & Osborne, J. (2022, October 26). To fight misinformation, we need to teach that science is dynamic. *Scientific American.* https://www.scientificamerican.com/article/to-fight-misinformation-we-need-to-teach-that-science-is-dynamic/

In Preparation

Pimentel, D.R., Moriarty, T.W., & Carlson, J.C. Science teachers' perceptions of mixed grade level professional learning communities.

Pimentel, D.R., Reigh, E., Brown, B.A. & Lee, V.R. 'If I see it in school, I probably take it as the truth': Students' and teachers' conceptions of evaluating socioscientific data representations.

Grants, Fellowships, and Awards

Reinventing Scientific Literacy for an Age of Misinformation (*co-author, awarded to Jonathan Osborne*), Anonymous Donor ($100,000)	2022
OpenSciEd Research Agenda Seed Funding (*co-author, awarded to Janet Carlson)*, Digital Promise and the Carnegie Corporation of New York ($9,000)	2022
Dissertation Support Grant, Stanford University ($5,000)	2022
Markowski-Leach Scholarship, Horizons Foundation ($2,500)	2022
Shriram Family Fellowship in Science Education, Stanford University ($14,500)	2018 – 2020
Outstanding Mentor of an American Indian, Alaska Native, Native Hawaiian and Pacific Islander Student, Stanford Native American Cultural Center	2019
Enhancing Diversity in Graduate Education (EDGE) Fellowship, Stanford University ($8,000)	2018
Science Educators for Urban Schools Scholarship, Robert Noyce Foundation, Boston College ($59,000)	2013
Charles F. Donovan Urban Teaching Scholarship, Boston College ($29,000)	2013
Sharp Urban Teaching Scholarship, Boston College ($10,000)	2013

Research Experience

Catalyzing Capacity: A Network for Developing Curriculum Researchers Focused on Equity
2022 – 2023
Graduate Research Assistant
Center to Support Excellence in Teaching (CSET), Stanford University, Stanford, CA
Primary Investigator: Janet Carlson, Ph.D.

The 5-Point Journal Integrity Initiative
2022
Graduate Research Assistant
Stanford University, Stanford, CA
Primary Investigator: John Willinsky, PhD

Critical Data Literacy
2021 – 2022
Graduate Research Assistant
Stanford University, Stanford, CA
Primary Investigators: Bryan Brown, PhD & Victor Lee, PhD

Teaching Science in a "Post-Truth" Society
2021 – 2022
Graduate Research Assistant
Stanford University, Stanford, CA
Primary Investigator: Jonathan Osborne, Ph.D.
Funded by the Gordon and Betty Moore Foundation

Generative Formative Assessment
2018 – 2022
Graduate Research Assistant
Science in the City Lab, Stanford University, Stanford, CA
Primary Investigator: Bryan Brown, Ph.D.

Computational Thinking, Investigation Strategies, and Online Games
2018 – 2021
Graduate Research Volunteer
AAALab, Stanford University, Stanford, CA
Primary Investigator: Daniel Schwartz, Ph.D.
Funded by the Stanford Institute for Human-Centered Artificial Intelligence

The Efficacy of the Wipro Science Education Fellowship as a Model of Science Teacher Leadership Professional Development
2018 – 2020
Graduate Research Assistant
Center to Support Excellence in Teaching (CSET), Stanford University, Stanford, CA
Primary Investigator: Janet Carlson, Ph.D.

Constructing and Critiquing Arguments in Middle School Science Classrooms: Supporting Teachers with Multimedia Educative Curriculum Materials
2012 – 2014
Research Assistant
Boston College, Chestnut Hill, MA
Primary Investigator: Katherine McNeill, Ph.D.
Funded by the National Science Foundation

Conference Presentations

Pimentel, D.R. & Osborne, J. (2023, August). Misinformation in science: The response of science education. [Paper presentation]. Paper presented at the annual meeting of the European Science Education Research Association.

Pimentel, D.R. (2023, August). Learning to evaluate scientific evidence in the age of digital information. [Poster presentation]. Poster presented at the annual meeting of the European Science Education Research Association.

Pimentel, D.R. (2023, April). Students' evaluations of science (dis)Information. [Paper presentation]. Paper presented at the annual meeting of NARST.

Osborne, J.O., Allchin, D., Feinstein, N., Baram-Tsabari, A., & **Pimentel, D.R.** (2023, April). Reinventing scientific literacy for an age of misinformation: NGSS 2.0. [Symposium session]. Symposium presented at the annual meeting of NARST.

Pimentel, D.R. & Osborne, J. (2023, April). Learning to evaluate science (mis)Information on the internet. [Paper presentation]. Paper presented at the annual meeting of the American Education Research Association.

Pimentel, D.R., Wilkerson, M.H., & Horton, N. (2023, April). Tools for learning and doing data science at the K–12 level. [Symposium session]. Symposium presented at the annual meeting of the American Educational Research Association.

Pimentel, D.R., & Osborne, J. (2022, July). *Science education in an age of misinformation* [Paper presentation]. Paper presented at the biennial meeting of the International History, Philosophy, and Science Teaching Group (IHSPT).

Pimentel, D. R., Reigh, E., Lee, V.R., & Brown, B. A. (2022, June). High school students' conceptions of climate change and COVID-19 data presented in infographics. In J. L. Polman, I. Tabak, & T. C. Tran (Chairs), *Cultivating critical, justice-oriented data literacies in a post-truth world* [Symposium]. Poster presented at the annual International Conference of the Learning Sciences (ICLS).

Pimentel, D.R., Reigh, E., Lee, V.R, Brown, B.A. (2022, April). *Data and distrust: Epistemic vigilance and students' evaluations of infographic trustworthiness* [Roundtable presentation]. Roundtable presented at the annual meeting of the American Education Research Association (AERA).

Selbach-Allen, M., **Pimentel D.R.**, & Reynante, B. (2022, April). *Exploring K–12 teachers' views of integrated STEM practices* [Roundtable presentation]. Roundtable presented at the annual meeting of the American Education Research Association (AERA).

Wilsey, M., Brown, B.A., & **Pimentel, D.R.** (2022, April). Explaining as learning: Sense-making through generative formative assessment in science [Paper presentation]. Paper presented at the annual meeting of the American Education Research Association (AERA).

Reynante, B., Selbach-Allen, M., & **Pimentel D.R.** (2022, April). *K–12 math and science teachers' conceptions of integrating STEM* [Poster presentation]. Poster presented at the annual meeting of the American Education Research Association (AERA).

Reigh, E., **Pimentel, D.R.**, Lee, V.R, Brown, B.A. (2022, March). *Putting on a 'skeptic hat': Teachers' and students' conceptions of critiquing socioscientific data infographics* [Paper presentation]. Paper presented at the annual meeting of NARST.

Pimentel, D.R. (2022, March). *Teachers' conceptions of phenomena in the secondary science classroom* [Poster presentation]. Poster presented at the annual meeting of NARST.

Pimentel, D.R., Moriarty, T.W., & Carlson, J. (2021, April). *Supporting science instruction with vertical teams: Teachers' perceptions of mixed grade-band professional learning communities* [Paper presentation]. Paper presented at the annual meeting of NARST. Virtual Conference.

Pimentel, D.R., & Stovall, J.L (2021, April). *Supporting math and science teachers' noticing of inequitable participation with video-based instructional coaching groups* [Paper presentation]. Paper presented at the annual meeting of the American Education Research Association (AERA). Virtual Conference.

Selbach-Allen, M., Reynante, B., & **Pimentel, D.R.** (2021, April). *Exploring teachers' beliefs about disciplinary hierarchies in STEM education: Implications for integrated STEM* [Paper presentation]. Paper presented at the annual meeting of the American Education Research Association (AERA). Virtual Conference.

Pimentel, D.R. (2020, June). *Learning to teach with phenomenon-based lessons in the high school science classroom* [Poster presentation]. Poster to be presented at the International Conference of the Learning Sciences. Nashville, TN. (Conference Cancelled)

Pimentel, D.R., & Zhang, S. (2020, April). *Identifying investigation strategies through an online simulation game* [Poster presentation]. Poster to be presented at the annual meeting of the American Education Research Association (AERA). San Francisco, CA. (Conference Cancelled)

Pimentel, D.R., Reynante, B., & Selbach-Allen, M. (2020, April). *Integrated STEM practices: Exploring overlap in K-12 STEM education* [Paper presentation]. Paper to be presented at the annual meeting of the American Education Research Association (AERA). San Francisco, CA. (Conference Cancelled)

Pimentel, D.R. (2020, March). *Exploring high school science teachers' conceptions of phenomenon-driven instruction* [Poster presentation]. Poster to be presented at the annual meeting of NARST. Portland, OR. (Conference Cancelled)

Pimentel, D.R., Selbach-Allen, M., & Reynante, B. (2020, March). *Toward integrated STEM practices: Exploring the intersections of science, engineering, and mathematical practice* [Paper presentation]. Paper to be presented at the annual meeting of NARST. Portland, OR. (Conference Cancelled)

Pimentel, D.R. (2019, November). *Teaching with social justice-oriented science phenomena* [Paper presentation]. Paper presented at the 9th International Conference on Education and Social Justice. Honolulu, HI.

Pimentel, D.R. (2019, October). *Exploring high school science teachers' pedagogical content knowledge for phenomenon-based teaching* [Paper presentation]. Paper presented at the annual meeting of the Monash Education Research Community Conference. Clayton VIC, Australia.

Pimentel, D.R. (2019, September). *Curriculum as a tool for teacher learning: Supporting science instruction with educative curriculum materials* [Paper presentation]. Paper presented at the annual meeting of the Learning Sciences Graduate Student Conference. Evanston, IL.

Pimentel, D.R. (2019, May). *Supporting reform-based science instruction with educative curriculum materials* [Paper presentation]. Paper presented at the annual meeting of the Stanford Graduate School of Education SWAYWO Conference. Stanford, CA.

Pimentel, D.R., Reynante, B., & Selbach-Allen, M. (2019, May). *Mapping disciplinary practices: exploring overlap in K-12 STEM standards* [Paper presentation]. Paper presented at the annual meeting of the Stanford Graduate School of Education SWAYWO Conference. Stanford, CA.

Workshops

Pimentel, D.R., & Osborne J. (2022, October). *Science education in an age of misinformation.* Workshop to be presented at the annual meeting of the California Association of Science Educators, Palm Springs, CA.

Darling-Hammond, E., **Pimentel, D.R.**, & Bunderson, M. (2022, July). *Using online tools and UDL to elicit learner voice.* Workshop presented at the annual CAST UDL Symposium.

Pimentel, D.R. & Osborne, J. (2022, July). *Science education in an age of misinformation.* Workshop presented at the annual meeting of the National Science Teaching Association (NSTA), Chicago, IL.

Pimentel, D.R. (2022, May). *Tackling online misinformation in the science classroom.* Workshop presented at the Center to Support Excellence in Teaching, Stanford, CA.

Osborne, J.O. & **Pimentel, D.R.** (2022, March). *Teaching and learning science in a 'post-truth' society: New roles for socioscientific issues.* Workshop presented at the annual meeting of NARST, Vancouver, British Columbia, Canada.

Stovall, J.L. & **Pimentel, D.R.** (2020, February). *How to use film to have conversations about race in education.* Workshop presented to the Equity in Education Conference sponsored by the Center to Support Excellence in Teaching, Stanford, CA.

Pimentel, D.R., Moriarty, T.W., Parker, S., Ulman, T., Rankins, B., Goren, R. (2019, August). *Elementary Science and the NGSS.* Workshop presented to the Mountain View-Wisman Unified School District, Mountain View, CA.

Pimentel, D.R., Moriarty, T.W., Parker, S., Kanopka, K. (2019, August). *Implementing the 5E instructional model with NGSS curriculum.* Workshop presented to the San Jose Unified School District, San Jose, CA.

Stovall, J.L. & **Pimentel, D.R.** (2019, July). *How to use film to have conversations about race in education.* Workshop presented to the Hollyhock Teaching Fellowship Program, Stanford, CA.

Pimentel, D.R., Siedel, S., McBain, L., Tham, P. (2019, May). *Designing for student safety.* Workshop presented at the Hasso Plattner Institute of Design (d.school) at Stanford University. Stanford, CA.

Pimentel, D.R., Knight, A. M. & McNeill, K. L. (2014, April). *Reasoning in argumentation: Helping students apply science concepts.* Workshop presented at the annual meeting of the National Science Teachers Association. Boston, MA.

Katsh-Singer, R., **Pimentel, D.R.**, Gonzalez-Howard, M. & McNeill, K. L. (2014, April). *Supporting all students in writing scientific arguments.* Workshop presented at the annual meeting of the National Science Teachers Association. Boston, MA.

Invited Talks

Pimentel, D.R., Alberts, B., Osborne, J., Coffey, J. (2023, Nov). Rebuilding trust: Leveraging education to restore faith in science. Panel on Science Education in an Age of Misinformation. Scientists Speak Up at Stanford, Virtual, Palo Alto, CA, United States.

University Teaching Experience

The University of Alabama

CSE 693: Advanced Workshop, *Primary Instructor*	Spring 2024
CSE 467 / 567: Improving Science Teaching, *Primary Instructor*	Fall 2023

Stanford University

EDUC 208B: Curriculum Construction, *TA with Denise Pope*	Winter 2023
EDUC 200B: Introduction to Qualitative Research Methods, *TA with Denise Pope*	Fall 2022
EDUC 267C: Curriculum and Instruction in Science, *Primary Instructor*	Winter 2022
EDUC 267A & B: Curriculum and Instruction in Science, *TA with Bryan Brown*	Summer, Fall 2021
EDUC 261E: Curriculum and Instruction Elective in Data Science, *TA with Victor Lee*	Spring 2021
EDUC 267: Development of Scientific Reasoning and Knowledge, *TA with Polly Diffenbaugh*	Winter 2021
EDUC 285: Supporting Students with Special Needs, *TA with Linda Darling-Hammond & Elizabeth Kozleski (Winter 2021); Troya Ellis (Winter 2020); Shayna Sullivan (Spring 2019)*	Winter 2020, 2021 Spring 2019
EDUC 299: Equity and Schooling, *TA with Antero Garcia (Fall 2020); Jonathan Rosa & Anthony Villa (Fall 2019)*	Fall 2019, 2020

Professional Experience

Center to Support Excellence in Teaching (CSET), Stanford, CA

Wipro Science Education Fellowship Program *Instructional Science Coach and Professional Development Facilitator*	2018 – 2023
Hollyhock Fellowship Program *Instructional Science Coach and Professional Development Facilitator*	2019 – 2021

OpenSciEd Elementary Design Specifications Writing Team	2020
Design Specifications Co-author	
QiTian School Curriculum Development Team	2020
Science Curriculum Framework Co-developer	
Residential Education, Stanford, CA	2021 – 2023
Graduate Resident Associate, Duan Family Hall	
Graduate Life Office, Stanford, CA	2019 – 2021
Community Associate, Escondido Village	
Hasso Plattner Institute of Design (d.school), Stanford, CA	2018 – 2019
Design Research Intern, K12 Lab	
Math, Engineering, and Science Academy (MESA), Brooklyn, NY	2017 – 2018
Chemistry Teacher & Special Education Teacher	
Brooklyn Ascend High School, Brooklyn, NY	2016 – 2017
Founding High School Chemistry Teacher	
Leadership Prep Canarsie Middle Academy, Brooklyn, NY	2014 – 2016
Founding Middle School Science Teacher	

Professional Service

Service to the Discipline

Journal of Statistics and Data Science Education, Manuscript Reviewer	2023-2024
Journal of Research in Science Teaching, Manuscript Reviewer	2023-2024
NARST Annual International Conference, Proposal Reviewer	2019-2023
International Society of the Learning Science Annual Meeting, Proposal Reviewer	2021-2023
British Journal of Education Technology, Manuscript Reviewer	2022
Learning Sciences Graduate Student Conference, Proposal Committee	2019, 2022
Journal of Pre-College Engineering Education Research (J-PEER), Manuscript Reviewer	2021 – 2022
NARST Graduate Student Committee, Scholarship Committee Volunteer	2020 – 2022
Science & Education, Manuscript Reviewer	2019

Service to the University

Stanford Title IX Office, Title IX Panelist	2020 – 2021
Resilient 1st Gen (R1G) Collaborative Learning Group, Co-Director	2019 – 2021
Stanford Graduate School of Education SWAYWO Conference, Planning Committee	2019 – 2021
Stanford Graduate School of Education SWAYWO Conference, Proposal Reviewer	2019

| Stanford Graduate School of Education Student Guild, First-Year Cohort Representative | 2018 – 2019 |

Mentorship

Stanford Graduate School of Education Mentoring Program, Graduate Student Mentor	2021 – 2023
Enhancing Diversity in Graduate Education Fellowship, Graduate Student Mentor	2020 – 2023
Learning, Design, and Technology Master's Program, Project Mentor	2020 – 2022

Professional Affiliations

International History, Philosophy, and Science Teaching Group (IHPST)

European Science Education Research Association (ESERA)

International Society of the Learning Sciences (ISLS)

American Educational Research Association (AERA)

California Association of Science Educators (CASE)

National Association for Research in Science Teaching (NARST)

National Science Teachers Association (NSTA)

Relevant Skills

Stanford CITI (Collaborative Institute Training Initiative) certified

Proficient with Excel, SPSS, STATA, and R statistical analysis software

Proficient with NVIVO and Dedoose qualitative analysis software

Basic proficiency in Spanish