

Paulette Vincent-Ruz

University of Michigan
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Career Objective: My research program serves to bridge disciplinary knowledge (chemistry) with learning theories to advance equity and justice. This allows me to cross disciplinary borders and create a Nepantla (the in-between-space) to uplift Discipline-Based Education Researchers seeking to center equity in STEM education reform.

EDUCATION

University of Pittsburgh

Ph.D., Learning Sciences and Policy 2019
Dissertation Advisor: Christian D. Schunn, Ph.D.
“Conceptualizing Science Identity: Its Nature and the Gendered Role It Plays in Early Secondary Students’ Science Choices”

Universidad Nacional Autónoma de México, Mexico City, Mexico

B.Sc., Chemical Engineering (Honors) 2013
Dissertation Advisor: Luis D. Miranda, Ph.D.
“Dehydroalanine synthesis for the study of palladium catalyzed tandem reaction”

M.Sc, Chemistry (Organic Synthesis) ABD
Total Number of Graduate: 9
Thesis Advisor: Luis D. Miranda, Ph.D.

APPOINTMENTS

University of Michigan

Post-doctoral Fellow 2020-current
Advisor: Timothy A. McKay, Ph.D.
Focus: Discipline Based Education Research (Chemistry)

- Design and evaluation of classroom interventions with an equity focus
- Support for instructors to make equitable changes on remote instruction during COVID-19 crisis

University of Pittsburgh

Post-doctoral Research Associate 2019
Advisor: Kevin Binning, Ph.D. & Christian D. Schunn, Ph.D.
Focus: Discipline Based Education Research (Chemistry)

- Designed surveys to measure science related attitudes in college
- Design of implementation of POGIL curriculum in large enrollment General Chemistry I classrooms

- Designed TA training to support POGIL instruction in large enrollment General Chemistry I classrooms

PUBLICATIONS

Refereed Journal Articles

* Indicates corresponding author

12. Izykowicz, M., Cai, J., **Vincent-Ruz, P.***, Rojas, A.*, (*under review*). A Counterstory to Deficit Narratives of "Underperformance" of Black Students in General Chemistry. *Target Journal: Journal of Chemical Education*

11. **Vincent-Ruz, P.***, Boase, N.R.*, (*under review*). Activating Chemistry Engagement: Supporting Students with Different Incoming Content Knowledge Science Education. *Submitted to: Science Education*

10. Ralph, V.*, Hosbein, K., Deshayes, M., **Vincent-Ruz, P.** (*accepted*). "Achievement Gaps" or Systemic Injustices: Intersections and Consequences of the Epistemology and Methodology used in Equity-Related Chemistry Education Research. *Submitted to: Journal of Chemical Education*

9. **Vincent-Ruz, P.***, Meyer, T., Roe, S. G., & Schunn, C. D. (2020). Short-Term and Long-Term Effects of POGIL in a Large-Enrollment General Chemistry Course. *Journal of Chemical Education*, 97(5), 1228-1238. DOI: [10.1021/acs.jchemed.9b01052](https://doi.org/10.1021/acs.jchemed.9b01052)

8. **Vincent-Ruz, P.***, & Schunn, C. D. (2019). Identity Complexes and Science Identity in Early Secondary: Mono-topical or in Combination with Other Topical Identities. *Research in Science Education*, 1-22. DOI: [10.1007/s11165-019-09882-0](https://doi.org/10.1007/s11165-019-09882-0)

7. Cannady, M.*, **Vincent-Ruz P.**, Chung J., & Schunn C. D. (2019) Scientific Sensemaking: Intellectual resources that predict content learning *Contemporary Ed. Psychology*, 59, 101802 DOI: [10.1016/j.cedpsych.2019.101802](https://doi.org/10.1016/j.cedpsych.2019.101802)

6. Witherspoon, E. B.*, **Vincent-Ruz, P.***, & Schunn, C. D.* (2019). When making the grade isn't enough: The gendered nature of premed science course attrition. *Educational Researcher*, 48(4), 193-204. DOI: [10.3102/0013189X19840331](https://doi.org/10.3102/0013189X19840331)

5. **Vincent-Ruz P. ***, & Schunn C. D. (2018) The nature of Science Identity and its role as driver of student choices. *International Journal of STEM*, 5(1), 48-60. DOI: [10.1186/s40594-018-0140-5](https://doi.org/10.1186/s40594-018-0140-5)

4. **Vincent-Ruz, P. ***, Grabowski, J. J., & Schunn, C. D. (2018). The Impact of Early Participation in Undergraduate Research Experiences on Multiple Measures of Premed Path Success. *Scholarship and Practice of Undergraduate Research*, 1(3), 13-18. DOI: [10.18833/spur/1/3/12](https://doi.org/10.18833/spur/1/3/12)

3. **Vincent-Ruz, P. ***, Binning, K., Schunn, C. D., & Grabowski, J. J. (2018). The Effect of Math SAT on Women's Chemistry Competency Beliefs. *Chemistry Education Research and Practice*, 19, 342-351. DOI: [10.1039/C7RP00137A](https://doi.org/10.1039/C7RP00137A)

2. **Vincent-Ruz, P. ***, & Schunn, C. D. (2017). The increasingly important role of science competency beliefs for science learning in girls. *Journal of Research in Science Teaching*, 54(6), 790-822. DOI: [10.1002/tea.21387](https://doi.org/10.1002/tea.21387)

1. Mijangos M. V., González-Marrero J., Miranda L. D.*, **Vincent-Ruz P.**, Lujan-Montelongo A., Olivera-Díaz D., et al. (2012). Microwave-assisted C-3 selective oxidative radical alkylation of flavones. *Organic and Biomolecular Chemistry*, 10(15), 2946–2949. DOI: [10.1039/C2OB25249J](https://doi.org/10.1039/C2OB25249J)

Book Chapters

1. **Vincent-Ruz, P.*** (2020). Chapter 5: What does it mean to think like a chemist? In Neiles, K. & Koenig, A. (Eds.), *Becoming a Chemist: Scaffolding Professional Skills into Undergraduate Curricula* (1st ed). American Chemical Society pp. 57-79. DOI: [10.1021/bk-2020-1365.ch005](https://doi.org/10.1021/bk-2020-1365.ch005)

Op-Eds/Non-Refereed Journal Articles

Vincent-Ruz, P., On the Danger of Performative DEI Discourse. *Nature Chemistry Community Blog*. August 16th, 2020 ([13,527 views](#)).

Vincent-Ruz, P., Gallardo-Williams M.T. (2020). Teaching in the Times of COVID. *Nature Chemistry Community Blog*. March 16th, 2020 ([4,519 views](#)).

Technical Reports

Chung, J., Cannady, M. A., Schunn, C., Dorph, R., & **Vincent-Ruz, P.** (2016) Measures Technical Brief: Scientific Sensemaking. Retrieved from: <http://www.activationlab.org/wp-content/uploads/2016/02/SensemakingReport-3.2-20160331.pdf>

Articles in Preparation

* Indicates corresponding author

Vincent-Ruz, P.*, Koester, B.P., Derry, H.A., Hayward, C., Ecoach Collaboration, McKay, T.A. (*in prep*). The Fragility of Values Affirmation Interventions: Critical Components, Mechanisms of Action, and Equity Implication. *Target Journal: Journal of Research and Science Teaching*

Hosbein, K.N., Deshayé, M., Ralph, V.R., **Vincent-Ruz, P.*** (*in prep*). QuantCrit as Paradigm for Equitable Chemistry Education Research. *Target Journal: Patterns, Cell Press*

RESEARCH MENTORING

Graduate Students

Isaac Blythe (they/them), Graduate Student in Chemistry at University of Michigan.
Jan 2021 – present

Ph.D. Advisor: Melanie Sandford (Organic Chemistry)

Thesis Chapter: Systemic Barriers Experienced Trans and Non-Binary Students in Chemistry

This study will uncover and illuminate barriers that transgender students face during the graduate school in chemistry.

- Queer Methodologies
- Chemistry Education Research

Undergraduate Students

Marissa Mizykowicz (she/her), Undergraduate Student in Chemistry at Salisbury University

Jan 2021 – present

Undergraduate Advisor: Anthony Rojas (Organic Chemistry)

The objective of this study is to understand how student's passion and engagement support their achievement in General Chemistry.

- Quantitative Methods
- Chemistry Education Research

AWARDS

2019 Student Leadership Award, *University of Pittsburgh School of Education*

CAS Future Leaders in Chemistry Award, *American Chemical Society*

INVITED TALKS AND PANELS

Departmental Talks

2021 My Journey to QuantCrit: How the Scientist Met the Fugitive in the Borderlands (June 5th, 2021) University of East Carolina, Department of Chemistry.

My Journey to QuantCrit: How the Scientist Met the Fugitive in the Borderlands (June 7th, 2021) University of California Irvine, Department of Chemistry.

REACT Framework as a starting point to solve equity problems in Chemistry Education (February 17th, 2021) The Center for Sustainable Nanotechnology (CSN).

2020 Becoming a chemist: The role of chemistry identity on persistence and development of chemist's professional skills (December 3rd, 2020) CINVESTAV, Department of Chemistry.

Short and long-term effects of POGIL in large enrollment General Chemistry course (November 6th, 2020) Portland State University Chemistry Department.

Becoming a chemist: The role of chemistry identity on persistence and development of chemist's professional skills (October 25th, 2020) University of Sydney Chemistry Department.

REACT Framework as a starting point to solve equity problems in Chemistry Education (October 15th, 2020) University of Michigan Department of Chemistry Seminar Series.

- 2019** Measuring and Defining Engagement Panel (July 13th 2019) Visitors Studies Association; Detroit, MI.
- 2018** Supporting freshmen undergraduate students STEM trajectories– School of Chemistry, Universidad Nacional Autonoma de Mexico; Mexico City, Mexico, August 17th.

Invited Conference Talks

- 2021** Invited Speaker to the Leaders Overcoming Great Inequalities in Chemistry (August 7th-13th 2021) Leaders Overcoming Gender Inequality in Chemistry (LOGIC) conference.
- 2020** REACT Framework as a starting point to solve equity problems in Chemistry Education (October 7th, 2020) Canadians Working for Inclusivity in Chemical Sciences, CWIC Talk Series.
- C&EN Futures Festival, leading scientists look to discoveries of tomorrow (August 25th, 2020) American Chemical Society
- Teaching in the Times of Covid-19 (April 14th, 2020) Webinar for Life Sciences South Florida/Florida International University.

Panel Invites

- 2021** Invited Panelist to discussion for “Picture a Scientist” movie (May 28th, 2021) Santa Clara University, California.
- 2020** Learning Environments in the time of COVID-19 Panel (June 10th, 2020) University of Michigan Ann Arbor.
- Learning Environments in the time of COVID-19 Panel (May 26th, 2020) Center for Academic Innovation's AIM Research Data Privacy Panel.

CONFERENCE PAPERS AND PRESENTATIONS

Conference Talks

- 2021** **Vincent-Ruz, P.*** What does it mean to think like a chemist? *American Chemical Society Spring Virtual Conference.*
- Hosbein, K.N., Deshayee, M., Ralph, V.R., **Vincent-Ruz, P.*** QuantCrit as Paradigm for Equitable Chemistry Education Research *American Chemical Society Spring Virtual Conference.*
- 2020** **Vincent-Ruz P.***, Meyer T., Roe S.G., & Schunn C. D. Short and long-term effects of POGIL in a large enrollment general chemistry course. *National Association of Research and Science Teaching*, Portland, OR (Cancelled).
- Vincent-Ruz, P.***, & Schunn, C.D. Gendered Effects of POGIL intervention in a large enrollment general chemistry course. *American Chemical Society*, Philadelphia, PA (Cancelled).

2019 Vincent-Ruz, P.*, Mapping #ChemTwitter: Structure, challenges & opportunities. *American Chemical Society* Orlando, FL.

Vincent-Ruz, P.*, & Schunn, C.D. Science Identity's gendered role on middle-schoolers' career preferences. *National Association of Research and Science Teaching* Baltimore, MD.

2018 Vincent-Ruz, P.*, & Schunn, C.D. The influence of gender and ethnicity on student's endorsement of Science Identity. *Gender & STEM Conference*, Eugene, OR.

Vincent-Ruz, P.*, Witherspoon, E.B.*, & Schunn, C.D.* The role of attitudinal factors on the gendered nature of pre-med STEM course attrition. *Gender & STEM Conference*, Eugene, OR.

Vincent-Ruz, P.*, & Garcia, G.A. STEM professors' sensemaking of culturally relevant pedagogy at one Hispanic-Serving Institution. *National Association for Research in Science Teaching Association*, Atlanta, GA.

Vincent-Ruz, P.*, Page, L.C., & Schunn, C.D. The effect of early undergraduate research experiences on STEM pathway persistence & degree attainment. *Society for Research in Education Effectiveness*, Washington, DC.

2017 Vincent-Ruz, P.*, Binning, K.R., Schunn, C.D., & Grabowski, J.J., The effect of SAT math scores on women's self-efficacy and its implications for chemistry learning. *National Association for Research and Science Teaching*, San Antonio, TX.

Vincent-Ruz, P.*, Dorph, R., & Schunn, C.D. For whom does Science Identity matter? *American Educational Research Association*, San Antonio, TX.

CONFERENCE POSTERS

2019 Vincent-Ruz, P.* & Schunn, C. D., An Understanding of the Impact of a Process Oriented Guided Inquiry Learning (POGIL) intervention on students' attitudes and academic achievement. *Gordon Chemistry Education Conference* Lewiston, ME.

2015 Vincent-Ruz, P.*, Cannady, M., Schunn, C. D., & Dorph, R. Measuring the skills that predict learning in middle-school science *REASON spring school on scientific reasoning and argumentation* Munich, Germany.

GRANTS

Awarded

2021 Royal Society of Chemistry
Equity Centered Mentoring In Chemistry **Paulette Vincent-Ruz (PI)** & Katherine Hosbein (Co-PI)
\$5,000

2018 Office of the Chancellor, University of Pittsburgh
“Building Bridges: Sustaining our Commitment to Equity and Justice by Empowering Minoritized Students to Transform the Educational Landscape in Pittsburgh and Beyond” Valerie Kinloch (PI), **Paulette Vincent-Ruz (Co-PI)**, Ashley Shafer (Co-PI), Nicole Cristobal (Co-PI) & Xhey Evans-El (Co-PI)
\$50,000

Declined

2020 National Science Foundation
Fostering classroom equity in large enrollment courses, through a tailored instructor intervention Timothy A. McKay (PI), **Paulette Vincent-Ruz (Co-PI)**
\$150,000

SPENCER Foundation
“Pandemic Effects on STEM Student Pathways: An Examination of COVID-19 Impacts on Three Processes of Student Persistence in STEM Degree Programs” Timothy A. McKay (PI), **Paulette Vincent-Ruz (Co-PI)**, W. Carson Byrd (Co-PI), Benjamin P. Koester, and Steve Lonn
\$50,000

National Science Foundation
RAPID: “Pandemic Effects on STEM Student Pathways: An Examination of COVID-19 Impacts on Three Processes of Student Persistence in STEM Degree Programs” Timothy A. McKay (PI), **Paulette Vincent-Ruz (Co-PI)**, W. Carson Byrd (Co-PI), Benjamin P. Koester, and Steve Lonn
\$200,000

2019 National Science Foundation
ECR DBER DCL: Testing a Functional Framework for Student Engagement in Transformed Active Learning Classrooms **Paulette Vincent-Ruz (PI)**, Sean Garret-Roe (Co-PI)
\$500,000

INDEPENDENT RESEARCH COLLABORATIONS

Current PI: Systemic Barriers Experienced Trans and Non-Binary Students in Chemistry

Collaborator: [Dr. Michelle Nolan](#). University of Florida.
Student: Isaac Blythe, Gradstudent at University of Michigan.

PI: Mechanisms of Action Behind Student’s Cognitive and Affective Responses to Ungrading Policies

Collaborator: [Dr. Renee Link](#). University of California, Irvine.

PI: Equitable Effects of Flipped Classrooms in Chemistry

Collaborator: [Dr. Anthony Rojas](#), Salisbury University.
Student: Marissa Mizykowicz Undergraduate Student at Salisbury University

PI: Developing Guidelines for QuantCrit Practices in Chemistry Education Research

Co-PI: [Dr. Vanessa Ralph](#) (Postdoctoral Fellow) University of Wisconsin, Madison.

Co-PI: [Dr. Kathryn Hosbein](#) (Postdoctoral Fellow) University of Michigan

Past Collaborator: Evaluation of an Adaptive Learning Intervention

PI: [Dr. Nathan Boase](#). Queensland University of Technology

RESEARCH EXPERIENCE

- 2020** **Sloan Equity and Inclusion in STEM Introductory Courses**
The SEISMIC project aims to advance equity and inclusion in foundational STEM courses. Our model for change is grounded in recent research exploring the reasons for the relatively slow adoption of evidence-based approaches to STEM education
Research Scientist
- Quantitative data analysis
 - Grant writing
- 2019-2020** **Social Belonging Intervention**
Do admissions messages convey to students that diverse students are valued on campus and that students can grow to belong in the college community and succeed?
Research Scientist
- Survey development and validation
 - Quantitative data analysis
 - Project management
- 2018-2020** **Understanding the Effect of POGIL on student's critical outcomes**
Research Scientist
- Survey development and validation
 - Intervention implementation and design
 - Quantitative data analysis
 - Project management
 - Grant Writing
- 2018-2019** **Using Social Network Analysis to understand the diffusion of information of chemistry on social media**
Partnership with: Chemistry & Engineering News, American Chemical Society
Research Scientist
- Social network analysis
- 2017-2018** **Becoming a Hispanic Serving Institution: A Multiple Case Study Approach to Understanding the Process of Enrolling and Serving Latina/o Students**
PI: Gina Ann Garcia
Graduate Student Researcher
- Qualitative data analysis

2016-2018 **Build, Understand, & Tune Interventions that Cumulate to Real Impact**

Advisor: Christian D. Schunn
Graduate Student Researcher

- Survey development and validation
- Quantitative data analysis
- Project management

2014-2018 **Collaborative Research: Studying the Malleability and Impact of Science Learning Activation**

Advisor: Christian D. Schunn
Graduate Student Researcher

- Survey development and validation
- Quantitative data analysis

TEACHING EXPERIENCE

Teaching Assistant

Chemistry Education Research
Professor: Ginger Shultz

Fall 2021

Teaching Assistant

Teaching and Learning in Secondary Science and Mathematics 3
Professor: Dr. Kari Kokka

Spring 2019

Teaching Assistant

History and Politics of Higher Education
Professor: Dr. Gina A. Garcia

Fall 2018

Professional Development for K-12 Teachers

Research Experience for Teachers
Design Based Learning Curriculum Development
48-Hour Workshop per year

2016-2018

K-12 Teaching Experience

Colegio Frances del Pedregal, Mexico City, Mexico
Chemistry Teacher –9th grade

2013

PROFESSIONAL SERVICE

National Associations Service

Co-Chair of the EEC Symposium Committee. Equity and Ethics Committee, *NARST*
(2020-2023)

Peer Review for Journals (Number of reviews to date)

Research in Science Education (7)
Chemistry Education Research and Practice (7)
Science Education (4)
Journal of Chemical Education (5)
CBE Life Sciences Education (2)

ACS Central Science (1)
International Journal of STEM Education (1)
Gender and Education (1)
Educación Química (1)

Conference Reviewing

NARST Annual Meeting Proposal Reviewer (2018, 2019)
AERA Annual Conference Proposal Reviewer (2018)

DEPARTMENTAL/UNIVERSITY SERVICE

President of the Council for Graduate Students in Education (2018-2019)
Vice-President of the Council for Graduate Students in Education (2017-2018)
School of Education Dean Search Committee (2016)

PROFESSIONAL MEMBERSHIPS

National Association for Research on Science Teaching
American Educational Research Association
American Chemical Society

ADVANCED STATISTICAL TRAINING & SOFTWARE KNOWLEDGE

Advanced Statistical Skills

Latent Class Analysis
Hierarchical Linear Modeling
Factor analysis
Item Response Theory Analysis
Coarsened Exact Matching
Social Network Analysis
Maximum Likelihood Modeling

Proficiency with statistical software

R (Advanced)
ORA for Social Network Analysis (Intermediate)