

**Rebecca Sansom**  
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### Education

<b>Brigham Young University</b> Provo, UT	<b>Doctor of Philosophy—Educational Inquiry, Measurement, and Evaluation</b> <ul style="list-style-type: none"> <li>Dissertation: Understanding STEM Faculty Members' Instructional Decisions about Evidence-Based Instructional Practices</li> </ul>	2019
<b>Southern Utah University</b> Cedar City, UT	<b>Master of Education—Educational Leadership</b> <ul style="list-style-type: none"> <li>LEAD program for Administrative Licensure</li> </ul>	2013
<b>Harvard University</b> Cambridge, MA	<b>Master of Arts—Chemistry and Chemical Biology</b> <ul style="list-style-type: none"> <li>Program in Molecular, Cellular and Chemical Biology</li> </ul>	2005
<b>Boston University</b> Boston, MA	<b>Bachelor of Arts—Chemistry</b> <ul style="list-style-type: none"> <li><i>Summa cum laude</i>, with Distinction, Boston University Trustee Scholar</li> </ul>	2001

### External Funding

<b>National Science Foundation</b> Discovery Research K-12 Program	<b>Developing the Pedagogical Skills and Science Expertise of Teachers in Underserved Rural Settings DRL-2102383</b> <ul style="list-style-type: none"> <li>PI, Novel professional learning via Technology-Mediated Lesson Study, to support social networks of rural science teachers (\$2,997,818)</li> </ul>	2021-2025
<b>National Science Foundation</b> Research Experiences for Undergraduates Program	<b>Chemistry and Biochemistry REU Site to Prepare Students for Graduate School and an Industrial Career CHE-1757627/CHE-2050872</b> <ul style="list-style-type: none"> <li>Co-PI, Program Director for Research Experiences for Teachers (\$331,950/\$371,250)</li> </ul>	2018-2023
<b>National Science Foundation</b> Improving Undergraduate STEM Education Program	<b>The STEM Faculty Institute to Promote Faculty Change DUE-1712056</b> <ul style="list-style-type: none"> <li>Co-PI, Professional development and mentoring for the use of evidence-based instructional practices by STEM faculty (\$324,945)</li> </ul>	2017-2023

### Academic and Work Experience

<b>Texas A&amp;M University</b> College Station, TX	<b>Assistant Professor of Science Education</b> <ul style="list-style-type: none"> <li>Rural Science Teacher Professional Development</li> <li>Elementary and Secondary Science Methods</li> </ul>	2024-present
<b>Brigham Young University</b> Provo, UT	<b>Associate Teaching Professor of Chemistry (2020-2024)</b> <b>Assistant Teaching Professor of Chemistry (2014-2020)</b> <ul style="list-style-type: none"> <li>Coordinator for General Chemistry Laboratories</li> <li>General Chem 105, 106, 107; Chem for Preservice Teachers 331</li> <li>Co-Creator of BYU Chem Camp for youth ages 9-14</li> </ul>	2014-2024
<b>National Science Foundation</b> Arlington, VA	<b>Albert Einstein Distinguished Educator Fellow</b> <ul style="list-style-type: none"> <li>Directorate for Education and Human Resources, Division of Undergraduate Education</li> <li>Robert Noyce Teacher Scholarship Program and Math Science Partnerships/STEM-C Partnerships Program</li> </ul>	2013-2014
<b>Utah State Board of Education</b> Salt Lake City, UT	<b>Consultant</b> <ul style="list-style-type: none"> <li>Planning and Facilitation Team for Utah Science Core Academy</li> <li>Writer and Team Lead for OER textbooks and state SEEd standards</li> <li>Assessment Writing Team for statewide chemistry exams</li> </ul>	2012-2022
<b>Jordan School District</b> West Jordan, UT	<b>Teacher and Secondary Science Specialist</b> <ul style="list-style-type: none"> <li>Chemistry and Biology concurrent enrollment teacher at Bingham High School: Chem 1010, Chem 1110/1115, Biol 1010/1015, Biol 1090</li> <li>Advisor to MESA club for underrepresented groups in STEM</li> <li>Science Specialist, State Science Education Coordinating Committee</li> </ul>	2010-2013
<b>Belmont School District</b> Belmont, MA	<b>Chemistry and Biology Teacher</b> <ul style="list-style-type: none"> <li>AP, Honors, and College Prep Chemistry; Honors Biology</li> <li>Updated lab curriculum using computer modeling and Vernier technology, nanotechnology and polymer chemistry</li> <li>Advisor to Science Club, Science Olympiad, Science Bowl</li> </ul>	2005-2010

## Publications

\*corresponding or co-corresponding author; †undergraduate student; §graduate student; †K-12 teacher

21. Poulsen, T. §, Leary, H., Daly, A., Sansom, R.L.\* (2024). "Uncovering the Connections Among Rural Science Teachers: A Social Network Analysis", *AERA Open*, 10. <https://doi.org/10.1177/23328584241253821>
20. Hudson, M., Leary, H., Longhurst, M., Stowers, J., Poulsen, T. §, Smith, C. § and Sansom, R.L.\* (2024), "Technology-mediated lesson study: a step-by-step guide", *International Journal for Lesson and Learning Studies*, 13(5), pp. 1-14. <https://doi.org/10.1108/IJLLS-07-2023-0094>.
19. Shipley, J. †, Sansom, R.L., Mickelsen, H. †, Nielson, J.B., Turley, R.S., West, R.E., Wright, F., St. Clair, B., Jensen, J.L. (2023) Iterating toward change: Improving student-centered teaching through the STEM faculty institute (STEMFI). *PLoS ONE* 18(8): e0289464. <https://doi.org/10.1371/journal.pone.0289464>.
18. Sansom, R.L.\*, Winters, D. §, St. Clair, B.E., West, R.E., Jensen, J.L. (2023) Factors that influence STEM faculty use of evidence-based instructional practices: An ecological model. *PLoS ONE* 18(1): e0281290. <https://doi.org/10.1371/journal.pone.0281290>.
17. Sansom, R.L.\* (2022) *Ecological Models of Behavior Change*. Invited, peer-reviewed, online publication. Available at [https://ascnhighered.org/ASCN/change\\_theories/collection/ecological\\_models.html](https://ascnhighered.org/ASCN/change_theories/collection/ecological_models.html).
16. West, R., Jensen, J., Sansom, R.L., Nielson, J., Wright, G., Johnson, M. (2022) STEM Faculty Institute: An Intensive Interdisciplinary Effort To Improve STEM Faculty Adoption of Evidence-based Instructional Practices. *Journal of College Science Teaching* 51(3), 78-87. Available at <https://www.nsta.org/journal-college-science-teaching/journal-college-science-teaching-januaryfebruary-2022/stem-faculty>.
15. Sansom, R.L.\* (2021) Make Thinking Explicit to Support Student Learning, in *Decision-Based Learning: An innovative pedagogy that unpacks expert knowledge for the novice learner*, edited by Wentworth, N., Plummer, K.J., and Swan, R.H. Emerald Publishing, Bingley, UK.
14. Sansom, R.L.\* (2021) Theory of Planned Behavior. Invited, peer-reviewed, online publication. Available at [https://ascnhighered.org/ASCN/change\\_theories/collection/planned\\_behavior.html](https://ascnhighered.org/ASCN/change_theories/collection/planned_behavior.html).
13. Sansom, R.L.\*, Clinton-Lisell, V., Fischer, L. (2021) Let Students Choose: Examining the Impact Open Educational Resources on Performance in General Chemistry. *Journal of Chemical Education* 98(3), 745-755. DOI: 10.1021/acs.jchemed.0c00595
12. West, R.E., Sansom, R.L., Nielson, J., Wright, G., Turley, R.S., Jensen, J., Johnson, M. (2021) Ideas for supporting student-centered STEM learning through remote labs: A response. *Educational Technology Research and Development* 69, 263-268. DOI: 10.1007/s11423-020-09905-y.
11. Sansom, R.L.\* (2020) Pressure from the pandemic: Pedagogical dissatisfaction when beliefs and practices do not align. *Journal of Chemical Education*. 97(9), 2378-2382. DOI: 10.1021/acs.jchemed.0c00657.
10. Sansom, R.L.\*, §Bodily, R., Bates, C. †, Leary, H. (2020). Increasing student use of a learner dashboard. *Journal of Science Education and Technology* 29(3), 386-398. DOI: 10.1007/s10956-020-09824-w.
9. Sansom, R.L.\*, Walker, J. (2019). Investing in Laboratory Courses. *Journal of Chemical Education* 97(1), 308-309. DOI: 10.1021/acs.jchemed.9b00714
8. §Reynders, G., Suh, E. †, Cole, R., Sansom, R.L.\* (2019). Developing Student Process Skills in a General Chemistry Laboratory. *Journal of Chemical Education* 96(10), 2109-2119.
7. Sansom, R.L.\*, Suh, E. †, Plummer, K.J. (2019). Decision-Based Learning: If I Just Knew Which Equation to Use, I Know I Could Solve this Problem! *Journal of Chemical Education* 96(3), 445-454.
6. Sansom, R.L.\* (2014-2022). *Chemistry 107 Laboratory Manual* (1<sup>st</sup>-8<sup>th</sup> eds.). Plymouth, MI: Macmillan Learning. *Updated and revised annually*.
5. Sansom, R.L.\* (2014). Uncovering student thinking through the Science Literacy Framework. *Chemistry Solutions* 1(2). <http://www.teachchemistry.org/periodical/issues/november-2014/uncovering-student-thinking-through-the-science-literacy-framework.html>.
4. Sansom, R.L. (2014) Constructing Ionic Compounds, Limiting Reactant, and Nuclear Energy Power Plants. In American Association of Chemistry Teachers Online Classroom Resources. <http://www.teachchemistry.org/classroom-resources>.
3. Li, Z., Sansom, R.L., Bonella, S., Coker, D., Mullin, A.S. (2005). A classical trajectory study of "supercollision" relaxation of hot pyrazine with CO<sub>2</sub>. *Journal of Physical Chemistry A* 109(34), 7657-7666.
2. Elioff, M.S., Sansom, R.L., Mullin, A.S. (2000). Vibrational Energy Gain in the  $\nu_2$  Bending Mode of Water via Collisions with Hot Pyrazine ( $E_{\text{vib}} = 37\,900\text{ cm}^{-1}$ ): Insights into the Dynamics of Energy Flow. *Journal of Physical Chemistry A* 104(45), 10304-10311.
1. Elioff, M.S., Fraelich, M., Sansom, R.L., Mullin, A.S. (1999). State-resolved collisional quenching of highly vibrationally excited pyridine by water: The role of strong electrostatic attraction in  $V \rightarrow RT$  energy transfer. *Journal of Chemical Physics* 111(8), 3517-3525.

## Presentations

34. NARST Annual Meeting, March 2024, Denver, CO. "Essential Elements of Technology Mediated Lesson Study (TMLS) Cycles: A Study with Rural Science Teachers". With Clara Smith<sup>§</sup>.
33. CADRE Learning Series on Rural Partnerships, January-February 2024.
32. DRK-12 PI Meeting, June 2023, Arlington, VA. "Professional Development for Culturally Responsive STEM Teaching in Diverse Rural Communities". With Angela Castagno, Brooke Moore, Becca Dovi, and Frank Bowman.
31. International Conference of the Learning Sciences, June 2023, Montreal, Canada. "Technology-Mediated Lesson Study: Facilitating Three-Dimensional Science with Rural Teachers". With Michelle Hudson, Heather Leary, Josh Stowers, Tracy Poulsen<sup>§</sup>, Clara Smith<sup>§</sup>, and Max Longhurst.
30. International Conference of the Learning Sciences, June 2023, Montreal, Canada. "Rural Science Teachers Collaborative Design and Iterative Implementation of Three-Dimensional Lessons". With Bryan Holder<sup>†</sup>, Austin Moore<sup>†</sup>, Max Longhurst, Heather Leary, Michelle Hudson, Tracy Poulsen<sup>§</sup>, and Clara Smith<sup>§</sup>.
29. Association for Science Teacher Education, Annual Meeting, January 12, 2023, Salt Lake City, UT, "The implications of technology-mediated lesson study in the professional learning of rural science teachers". With Tracy Poulsen<sup>§</sup>, Heather Leary, Max Longhurst, Josh Stowers.
28. American Association of Colleges & Universities, Transforming STEM Higher Education Conference, Poster Session, November 4, 2022, Arlington, VA, "An Ecological Model of STEM Faculty Change".
27. Western Regional Meeting of the American Chemical Society, Education During COVID Symposium, October 20, 2022, Las Vegas, NV, "Pivot or Pivotal Moment: Can pandemic changes translate to post-pandemic transformations?", *invited*.
26. Northern Rocky Mountain Educational Research Association, 39<sup>th</sup> Annual Conference, October 13, 2022, Billings, MT, "Uncovering the Connections between Rural Science Teachers". Tracy Poulsen<sup>§</sup>, presenter. Rebecca Sansom, Heather Leary, Max Longhurst, and Josh Stowers, co-authors. Refereed conference proceedings.
25. Utah Science Teachers Association, Annual Meeting, October 7, 2022, Provo, UT, "Crafting Questions that Support Student Reasoning in Three Dimensions: The Case of the Perm". With Lindsey Hansen<sup>§</sup>. *invited*.
24. Biennial Conference on Chemical Education, Think, Plan, Teach: Enacted Pedagogical Content Knowledge in Higher Education Symposium, August 2, 2022, West Lafayette, IN, "Why we do what we do: Factors that influence STEM faculty members' instructional decisions".
23. Utah Rural Schools Association, Annual Meeting, July 7, 2022, Cedar City, UT, "SEEd Standards: Science in Three Dimensions!"
22. Transforming Institutions National Meeting, Accelerating Systemic Change Network, Poster Session, June 9, 2021, online, "An Ecological Model for STEM Faculty Change".
21. American Chemical Society, 258<sup>th</sup> National Meeting, Get the Facts Out: Faculty & Student Perceptions of K-12 Teaching Careers Symposium, August 29, 2019, San Diego, CA, "Informal Science Teaching as a Gateway to Careers in Science Education", *invited*.
20. American Chemical Society, 258<sup>th</sup> National Meeting, Chemistry Education Research Symposium, August 27, 2019, San Diego, CA, "Easy as One, Two, Three: Adapting CER for the College Chemistry Classroom".
19. Gordon Research Conference, Chemistry Education Research and Practice, Poster Session, June 19, 2019, Lewiston, ME, "Understanding Instructional Decision-Making by STEM Faculty".
18. American Chemical Society, 257<sup>th</sup> National Meeting, Curricular Innovations in Undergraduate Chemical Education Impacted by NSF Symposium, April 3, 2019, Orlando, FL, "The STEM Faculty Institute: Understanding and Transforming Instructional Decision-Making", *invited*.
17. Utah Science Teachers Association, Annual Meeting, February 8, 2019, Provo, UT, "Writing Three-dimensional Assessments".
16. American Chemical Society, Biennial Conference on Chemistry Education, July 29, 2018, South Bend, IN, Organizer and Presider, Research in Chemistry Education Symposium.
15. Western States Chemistry Education Group, 5<sup>th</sup> Annual Meeting, April 21, 2018, Eugene, OR, "Effects of Decision-Based Learning on Exam Performance of General Chemistry Students".
14. American Chemical Society, 255<sup>th</sup> National Meeting, Fundamentals of Chemistry Outreach Education Symposium, March 21, 2018, New Orleans, LA, "Counselor Training Model for Summer Chem and BioChem Camps". *Selected for Sci-Mix*.
13. American Chemical Society, 255<sup>th</sup> National Meeting, Research on Learning in the Laboratory Symposium, March 21, 2018, New Orleans, LA, "Improving scientific dialogue through the evaluation of process skills".
12. Utah Science Teachers Association, Annual Meeting, February 10, 2018, Provo, UT, "Effects of Decision-Based Learning on Exam Performance of General Chemistry Students".
11. Gordon Research Conference, Chemistry Education Research and Practice, Poster Session, June 20, 2017, Lewiston, ME, "Student Reasoning Strategies for Interpreting Laboratory Observations".
10. American Chemical Society, 253<sup>rd</sup> National Meeting, Advances in e-Learning Symposium, April 3, 2017, San Francisco, CA, "Design-based research to improve student perceptions of autonomy and efficiency in an online learning system".
9. American Chemical Society, 253<sup>rd</sup> National Meeting, Writing in Chemistry Symposium, April 4, 2017, San Francisco, CA, "When does this matter in real life? Using chemical knowledge to make fuel choices".
8. Utah Science Teachers Association, Annual Meeting, February 10, 2017, Provo, UT, "Focusing on the Evidence: Helping Chemistry Students Interpret Laboratory Observations".

7. American Chemical Society, Biennial Conference on Chemistry Education, July 31-August 1, 2016, Greeley, CO, "Making Connections: Hybrid Labs for General Chemistry" workshop.
6. American Chemical Society, 251<sup>st</sup> National Meeting, Research on Learning in the Lab Symposium, March 14, 2016, San Diego, CA, "Engaging in Argument from Evidence in the General Chemistry Laboratory" with Matthew Allen.
5. American Chemical Society, 251<sup>st</sup> National Meeting, Safety Begins in the Classroom Symposium, March 13, 2016, San Diego, CA, "Wild, Wild West to GHS: Reflections on my first year as a general chemistry laboratory coordinator".
4. Gordon Research Conference, Chemistry Education Research and Practice, Poster Session, June 22, 2015, Lewiston, ME, "General Chemistry Laboratory Redesign".
3. American Chemical Society, Biennial Conference on Chemistry Education, August 7, 2014, Grand Rapids, MI, "Understanding evidence in chemistry: Engaging students in argumentation to support scientific conclusions" and "Dual enrollment courses: Collaboration, checks and balances for success".
2. National Science Teachers Association, National Conference on Science Education, April 6, 2014, Boston, MA, "Argument from evidence" with Amanda Rivera.
1. Utah Science Teachers Association, Annual Meeting, February 7, 2014, Provo, UT, "Argument from evidence in chemistry classes" and "Incorporating the engineering design process in elementary science" with Barbara Gentry.

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### **Professional Organizations and Service**

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- Proposal Review for National Science Foundation: Division of Research on Learning, Division of Undergraduate Education, Division of Mathematical and Physical Sciences
- Manuscript Review for *Journal of Chemical Education* and *Chemistry Solutions, Chemistry Education Research and Practice, Journal of Science Education and Technology, International Journal of STEM Education, Frontiers in Education, IEEE Transactions on Education*
- Association for Science Teacher Educators (ASTE)
- National Association for Research on Science Teaching (NARST)
- Northern Rocky Mountain Educational Research Association
  - Board member representing the State of Utah (2022-2024)
- American Chemical Society, Division of Chemical Education
  - Treasurer of the Central Utah Local Section of the ACS (2020-present)
- American Association of Chemistry Teachers
- National Science Teachers Association
- Utah Science Teachers Association

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### **Awards and Recognition**

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- Teaching and Learning Faculty Fellowship, Brigham Young University, 2023
- Early Career Teaching Award, Brigham Young University College of Physical and Mathematical Sciences, 2022
- Albert Einstein Distinguished Educator Fellowship, 2013-2014
- Iota Sigma Pi Undergraduate Award for Excellence in Chemistry, 2001
- Barry M. Goldwater Scholar, 2000