

Joshua Rosenberg, Ph.D.

Curriculum Vita

Contact Information

Associate Professor, STEM Education
Department of Theory and Practice in Teacher Education
The University of Tennessee, Knoxville
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Research Interests

Educational data science, science education, educational technology, computational social science

Education

Degrees

2018, PhD, Educational Psychology & Educational Technology
Michigan State University

2012, MA, Education
Michigan State University

2010, BS, Biology
University of North Carolina, Asheville

Additional Qualifications

2016, Graduate Certificate, Science Education
Michigan State University

2010, Educator's License - Science and Biology, Teacher Licensure Program
University of North Carolina, Asheville

Professional Experience

2023-present, Associate Professor, STEM Education
University of Tennessee, Knoxville

2018-2023, Assistant Professor, STEM Education
University of Tennessee, Knoxville

2012-2018, Graduate Research and Teaching Assistant
Michigan State University

2010-2012, Science Teacher (Biology and Earth Science)
Shelby High School, Shelby, NC

2009-2010, Science Teacher Intern (Biology and Chemistry)
C.D. Owen High School, Swannanoa, NC

Additional Professional Affiliations

Faculty Fellow, College of Emerging and Collaborative Studies, University of Tennessee, Knoxville

Faculty Fellow, Center for Enhancing Education in Mathematics and Sciences, University of Tennessee, Knoxville

Faculty Fellow, Education Research & Opportunity Center, University of Tennessee, Knoxville
Affiliated Researcher, AmplifyLearn.AI, University of Washington

Fellowships and Awards

2024, Professional Promise in Research and Creative Achievement award, University of Tennessee, Knoxville

2024, Lura Odland Excellence award, College of Education, Health, and Human Sciences, University of Tennessee, Knoxville

2023-2024, Expanding Horizons Mid-Career Faculty Development Program, University of Tennessee, Knoxville

2023, NSF CAREER awardee

2023, Faculty Mentor, SEC Emerging Scholars Program Postdoctoral Researcher (Maryrose Weatherton)

2023, Research Worth Reading Award, Research in Artificial Intelligence in Science Education Research Interest Group, National Association for Research in Science Teaching

2023, Outstanding Graduate Research Mentor Award, Graduate Student Senate, University of Tennessee, Knoxville

2022, Early Career Award, Technology as an Agent of Change in Teaching and Learning (TACTL) Special Interest Group (SIG), American Educational Research Association (AERA)

2021, Best Poster Award, Fourteenth International Conference on Educational Data Mining

2021-2022, Open Educational Resources (OER) Research Fellow, William and Flora Hewlett Foundation

2021, Louie M. & Betty M. Phillips Faculty Support in Education Award, University of Tennessee, Knoxville (UTK)

2021, Mentor, Summer Undergraduate Research Internship Program, Office of Undergraduate Research, UTK

2020, Research Assistant Award, Office of Undergraduate Research, UTK

2020, Southeastern Conference (SEC) Visiting Faculty Travel Grant Program (Host: Annelise Russell, Martin School of Public Policy, University of Kentucky)

2016, Best Paper Award, Technological Pedagogical Content Knowledge SIG, Society for Information Technology and Teacher Education International Conference

2014, Outstanding Paper Award, Society for Information Technology and Teacher Education International Conference

Grants

\$7,356,845; \$6,248,084 as Principal Investigator [PI] or Co-PI

PI, Co-PI, and Co-I

2024-2025, Investigator, *AI for Education: Developing Curricula, Planning for External Funding, and Connecting Faculty* (\$21,000; with PI Louis Rocconi), AI Tennessee Initiative, University of Tennessee, Knoxville.

2023-2028, PI, *CAREER: Creatively Reimagining Engagements with Data in Biology Learning Environments*, (\$846,612), NSF. [NSF Grant No. 2239152](#).

2022-2025, Co-PI, *Computer Science for Appalachia: Expanding a research-practice partnership to integrate computer science and literacy in rural East Tennessee schools*, (\$999,980; with PI Lynn Hodge). NSF. NSF Grant No. 2219418.

2022-2024, Co-PI, *Broadening participation in introductory computer science: investigating self-assessment practices for increasing student learning and self-efficacy in two institutional contexts* (\$299,836; with PI Alex Lishinski). NSF. [NSF Grant No. 2215245](#)

2022-2023, Co-PI, *Launching a Micro-credential in Educational Data Analytics* (\$10,000; with Co-PI Louis Rocconi). University of Tennessee, Knoxville's College of Education, Health, and Human Sciences Strategic Investment Program.

2022-2025, Co-PI, *Quantifying the robustness of causal inferences: Extensions and applications*. (\$899,319.13; PI: Kenneth Frank, Michigan State University; UTK subcontract: \$105,727). Institute of Education Sciences.

2021-2022, PI, *Not only for scientists and engineers: Advancing Bayesian methods for pre-collegiate learners* (\$1,991), Supplemental funding to NSF Grant No. [193770](#) (Dear Colleague Letter: Research Collaboration Opportunity in Europe for NSF Awardees). National Science Foundation.

2020-2025, Co-I, *Imagining possibilities in post-secondary education and STEMM in rural Appalachia* (\$1,208,563), National Institutes of Health.

2020-2021, Co-PI, *Propelling teacher professional development through FFAST feedback on student epistemic views* (\$15,000; PI: Christina Krist, University of Illinois Urbana-Champaign). Technology Innovations in Educational Research and Design Pilot Projects Program.

2019-2021, PI, *Understanding the development of interest in computer science: An experience sampling approach* (\$346,688). National Science Foundation [NSF]. <http://picsul.utk.edu/> (NSF Grant No. [1937700](#))

2019-2021, Co-PI, *CS for Appalachia: A research-practice partnership for integrating computer science into East Tennessee schools* (\$252,453; PI: Lynn Hodge, UTK). NSF. (NSF Grant No. [1923509](#))

2019-2022, Co-PI, *Advancing computational grounded theory for audiovisual data from STEM classrooms* (\$1,313,855; PI: Christina Krist, University of Illinois Urbana-Champaign; UTK subcontract: \$101,469). NSF. <https://tca2.education.illinois.edu/> (NSF Grant No. [1920796](#))

2019-2020, PI, *Planting the seeds for computer science education in East Tennessee through a research-practice partnership* (\$13,200). Community Engaged Research Seed Program, UTK.

2018-2020, Co-PI, *Exploring how beginning elementary mathematics teachers seek out resources through social media* (\$8,820; PI: Stephen Aguilar). Herman & Rasiej K-5 Mathematics Initiative, University of Southern California.

Senior Personnel

2020-2023, Senior Personnel, *Learning analytics in STEM education research institute* (\$933,150; PI, Shaun Kellogg, North Carolina State University; UTK subcontract: \$62,870. National Science Foundation (NSF), [NSF Grant No. 2025090](#)

2019-2022, Senior Personnel, *Medical entomology and geospatial analyses: Bringing innovation to teacher education and surveillance studies* (\$149,611; PI: Rebecca Trout Fryxell). United States Department of Agriculture - Agriculture and Food Research Initiative. (USDA Grant No. 2019-68010-29119) <https://www.megabitess.org/>

Publications

+ Denotes a collaboration with a mentee who is a graduate student

^ Denotes a collaboration with a mentee who is an undergraduate student

Books

Akcaoglu, M., Rosenberg, J. M., Lishinski, A., Narvaiz, S., & Bulut, O. (under contract). *Computational social science cookbook with R: A practical guide* (a volume in the *Chapman & Hall/CRC Big Data Series*). CRC Press.

Estrellado, R. A., Freer, E. A., Mostipak, J., Rosenberg, J. M., & Velásquez, I. C. (2020). *Data science in education using R*. Routledge. Note. All authors contributed equally. <http://www.datascienceineducation.com/>

Articles Published in Refereed Journals (57)

Pritchard, C., Borchers, C., Rosenberg, J. M., Fox, A. K., & Stegenga, S. M. (2024). The datafication of student information on X (Twitter). *Computers and Education Open*, 7, 1-10. <https://www.sciencedirect.com/science/article/pii/S2666557324000375>

- Dogucu, M., Kazak, S., & Rosenberg, J. M. (2024). The design and implementation of a Bayesian data analysis lesson for pre-service mathematics and science teachers. *Journal of Statistics and Data Science Education*, 1-21.
- Rosenberg, J., & Jones, R. S. (2024). Data science learning in grades K–12: Synthesizing research across divides. *Harvard Data Science Review*, 6(3), 1-30. <https://doi.org/10.1162/99608f92.b1233596>
- Fütterer, T., Omarchevska, Y., Rosenberg, J. M., & Fischer, C. (2024). How do teachers collaborate in informal professional learning activities? An Epistemic Network Analysis. *Journal of Science Education and Technology*, 1-15. <https://link.springer.com/article/10.1007/s10956-024-10122-y%3E>
- +Narvaiz, S., Lin, Q., Rosenberg, J. M., Frank, K. A., Maroulis, S. J., Wang, W., & Xu, R. (2024). konfound: An R Sensitivity Analysis Package to Quantify the Robustness of Causal Inferences. *Journal of Open Source Software*, 9(95), 1-6. <https://joss.theoj.org/papers/10.21105/joss.05779.pdf>
- Carpenter, J. P., Rosenberg, J. M., Kessler, A., Romero-Hall, E., & Fischer, C. (2024). The importance of context in teacher educators' professional digital competence. *Teachers and Teaching*, 1-17. <https://www.tandfonline.com/doi/full/10.1080/13540602.2024.2320155>
- Ranellucci, J., & Rosenberg, J. M. (2023). Students' interest, engagement, and achievement in online high school science courses. *Educational Psychology*, 1-19.
- Staudt Willet, K.B., Rosenberg, J.M. (2023). The design and effects of educational data science workshops for early career researchers. *Journal Formative Design in Learning*. <https://doi.org/10.1007/s41686-023-00083-7>
- Hodge, E. M., Rosenberg, J. M., & López, F. A. (2023). “We Don’t Teach Critical Race Theory Here”: A Sentiment Analysis of K-12 School and District Social Media Statements. *Peabody Journal of Education*, 1-15. <https://www.tandfonline.com/doi/full/10.1080/0161956X.2023.2261318>
- Garner, A. V., & Rosenberg, J. (2023). Utilizing iNaturalist to Support Place-Based Learning and Data Analysis. *Science Scope*, 46(7), 54-60. <https://www.nsta.org/science-scope/science-scope-fall-2023/using-inaturalist-support-place-based-learning-and-data>
- Rosenberg, J. M. (2023). Open and Useful? Exploring the Science Education Resources on OER Commons. *Contemporary Issues in Technology and Teacher Education*, 23(3), 490-507.
- Borchers, C., Rosenberg, J. M., & Swartzentruber, R. M. (2023). Facebook post data: a primer for educational research. *Educational Technology Research and Development*, 1-20. <https://link.springer.com/article/10.1007/s11423-023-10269-2>

- Rosenberg, J. M., Beymer, P. N., Phun, V., & Schmidt, J. A. (2023). Using intensive longitudinal methods to quantify the sources of variability for situational engagement in science learning environments. *International Journal of STEM Education*, 10(1), 68. <https://link.springer.com/article/10.1186/s40594-023-00449-0>
- Carpenter, J. P., Morrison, S. A., Rosenberg, J. M., & Hawthorne, K. A. (2023). Using social media in pre-service teacher education: The case of a program-wide twitter hashtag. *Teaching and Teacher Education*, 124, 1-17. <https://www.sciencedirect.com/science/article/pii/S0742051X23000240>
- Rosenberg, J., ^Borchers, C., Stegenga, S. M., ^Burchfield, M. A., Anderson, D., & Fischer, C. (2022). How educational institutions reveal students' personally identifiable information on Facebook. *Learning, Media, & Technology*. <https://www.tandfonline.com/doi/full/10.1080/17439884.2022.2140672>
- Rosenberg, J. M., ^Borchers, C., ^Burchfield, M. A., Anderson, D., Stegenga, S. M., & Fischer, C. (2022). Posts about students on Facebook: A data ethics perspective. *Educational Researcher*, 51(8), 547-550. <https://journals.sagepub.com/doi/full/10.3102/0013189X221120538>
- Kubsch, M., Krist, C., & Rosenberg, J. M. (2023). Distributing Epistemic Functions and Tasks - A framework for augmenting human analytic power with machine learning in science education research. *Journal of Research in Science Teaching*. <https://onlinelibrary.wiley.com/doi/full/10.1002/tea.21803>. Note. All authors contributed equally. This paper received the 2023 Research Worth Reading Award for the Research in Artificial Intelligence in Science Education Research Interest Group, National Association for Research in Science Teaching.
- Rosenberg, J. M., Kubsch, M., Wagenmakers, E.-J., & Dogucu, M. (2022). Making sense of uncertainty in the science classroom: A Bayesian approach. *Science & Education*, 31, 1239-1262. <https://link.springer.com/article/10.1007/s11191-022-00341-3>
- Jones, R. S., & Rosenberg, J. M. (2022). Characterizing whole class discussions about data and statistics with conversation profile analysis. *Journal of Mathematical Behavior*, 67, 1-16. <https://www.sciencedirect.com/science/article/abs/pii/S0732312322000645>
- Rosenberg, J. M., Schultheis, E., Kjellvik, M., Reedy, A., & +Sultana, O. (2022). Big data, big changes? A survey of K-12 science teachers in the United States on which data sources and tools they use in the classroom. *British Journal of Educational Technology*, 53(5), 1179-1201. <https://bera-journals.onlinelibrary.wiley.com/doi/10.1111/bjet.13245>
- +Michela, E., Rosenberg, J., Kimmons, R., +Sultana, O., ^Burchfield, M. A., & ^Thomas, T. (2022). "We are trying to communicate the best we can": Understanding districts' communication on Twitter during the COVID-19 pandemic. *AERA Open*, 8, 1-18. <https://doi.org/10.1177/23328584221078542>
- Trout Fryxell, R. T., Camponovo, M., Smith, B., Butefish, K., Rosenberg, J. M., Andsager, J. L., ... & Willis, M. P. (2022). Development of a community-driven mosquito surveillance

program for vectors of La Crosse virus to educate, inform, and empower a community. *Insects*, 13(2), 164. <https://www.mdpi.com/2075-4450/13/2/164>

Rutherford, T., Duck, K., Rosenberg, J. M., & Patt, R. (2022). Leveraging mathematics software data to understand student learning and motivation during the COVID-19 pandemic. *Journal of Research on Technology in Education*, 54(1), 94-131. <https://www.tandfonline.com/doi/full/10.1080/15391523.2021.1920520>

Aguilar, S. J., Rosenberg, J., Greenhalgh, S., Fütterer, T., Lishinski, A., & Fischer, C. (2021). A different experience in a different moment? Teachers' social media use before and during the COVID-19 pandemic. *AERA Open*, 7, 1-17. <https://journals.sagepub.com/doi/full/10.1177/23328584211063898>

+Lawson, M. A., Herrick, I. R., & Rosenberg, J. M. (2021). Better together: Mathematics and science pre-service teachers' sensemaking about STEM. *Educational Technology & Society*, 24(4), 180-192.

Schweinsburg, M., ... Luis, S. (2021). Same data, different conclusions: Radical dispersion in empirical results. *Organizational Behavior and Human Decision Processes*, 165(7), 228-249. <https://www.sciencedirect.com/science/article/pii/S0749597821000200> (Note. I was an author and contributor to this large-scale, collaborative project.)

Greenhalgh, S. P., Rosenberg, J. M., & Russell, A. (2021). The influence of policy and context on teachers' social media use. *The British Journal of Educational Technology*, 52(5), 2020-2037. <https://bera-journals.onlinelibrary.wiley.com/doi/10.1111/bjet.13096?af=R>

Frank, K. A., Lin, Q., Maroulis, S., Strassman, A., Xu, R., Rosenberg, J. M., Hayter, C., Mahmoud, R., Kolak, M., Dietz, T., & Zhang, L. (2021). Hypothetical case replacement can be used to quantify the robustness of trial results. *Journal of Clinical Epidemiology*, 134(6), 150-159. <https://www.sciencedirect.com/science/article/pii/S0895435621000366> Note. I was a scientific programmer for this project.

Rosenberg, J. M., Borchers, C., Dyer, E., Anderson, D. J., & Fischer, C. (2021). Advancing new methods for understanding public sentiment about educational reforms: The case of Twitter and the Next Generation Science Standards. *AERA Open*, 7, 1-17. <https://journals.sagepub.com/doi/10.1177/23328584211024261>

Ranellucci, J., Robinson, K., Rosenberg, J. M., Lee, Y.-K., Roseth, C., & Linnenbrink-Garcia. (2021). Comparing the roles and correlates of emotions in class and during online video lectures in a flipped anatomy classroom. *Contemporary Educational Psychology*, 64(4), 1-15. <https://doi.org/10.1016/j.cedpsych.2021.101966>

Akcaoglu, M., Rosenberg, J. M., Hodges, C. B., Hilpert, J. (2021). An exploration of factors impacting middle school students' attitudes toward computer programming. *Computers in the Schools*, 38(1), 19-35. <https://doi.org/10.1080/07380569.2021.1882209>

Rosenberg, J. M., & Krist, C. (2021). Combining machine learning and qualitative methods to elaborate students' ideas about the generality of their model-based explanations. *Journal*

of *Science Education and Technology*, 30(2), 255-267. <https://link.springer.com/article/10.1007%2Fs10956-020-09862-4>. Note. Both authors contributed equally.

Rosenberg, J. M., & Staudt Willet, K. B. (2021). Balancing participants' privacy and open science in the context of COVID-19: A response to Ifenthaler & Schumacher (2016). *Educational Technology Research & Development*, 69(1), 347-351.

Harper, F. K., Rosenberg, J. M., ^Comperry, S., ^Howell, K., & ^Womble, S. (2021). #Mathathome during the COVID-19 Pandemic: Exploring and reimagining resources and social supports for parents. *Education Sciences*, 11(2), 60, 1-24. <https://www.mdpi.com/2227-7102/11/2/60>

Anderson, D. J., Rowley, B., Stegenga, S., Irvin, P. S., & Rosenberg, J. M. (2020). Evaluating content-related validity evidence using a text-based, machine learning procedure. *Educational Measurement: Issues and Practice*, 39(4), 53-64. <https://onlinelibrary.wiley.com/doi/abs/10.1111/emip.12314>

Rosenberg, J. M., Reid, J., Dyer, E., Koehler, M. J., Fischer, C., & McKenna, T. J. (2020). Idle chatter or compelling conversation? The potential of the social media-based #NGSSchat network as a support for science education reform efforts. *Journal of Research in Science Teaching*, 57(9), 1322-1355. <https://onlinelibrary.wiley.com/doi/10.1002/tea.21660>

Carpenter, J., Rosenberg, J. M., Dousay, T., Romero-Hall, E., Trust, T., Kessler, A., Phillips, M., Morrison, S., Fischer, C. & Krutka, D. (2020). What should teacher educators know about technology? Perspectives and self-assessments. *Teaching and Teacher Education*, 95(10), 103-124. <https://doi.org/10.1016/j.tate.2020.103124>

Ranellucci, J., Rosenberg, J. M., & Poitras, E. (2020). Exploring pre-service teachers' use of technology: The technology acceptance model and expectancy-value theory. *Journal of Computer Assisted Learning*, 36(6), 810-824. <http://dx.doi.org/10.1111/jcal.12459>

Schmidt, J. A., Beymer, P. N., Rosenberg, J. M., Naftzger, N. J., & Shumow, L. (2020). Experiences, activities, and personal characteristics as predictors of engagement in STEM-focused summer programs. *Journal of Research in Science Teaching*, 57(8), 1281-1309. <https://onlinelibrary.wiley.com/doi/full/10.1002/tea.21630>

Greenhalgh, S. P., Rosenberg, J. M., Koehler, M. J., Akcaoglu, M., & Staudt Willet, K. B. (2020). Identifying multiple learning spaces within a single teacher-focused Twitter hashtag. *Computers & Education*, 148(4). <https://doi.org/10.1016/j.compedu.2020.103809>

Beymer, P. N., Rosenberg, J. M., & Schmidt, J. A. (2020). Does choice matter or is it all about interest? An investigation using an experience sampling approach in high school science classrooms. *Learning and Individual Differences*, 78(2), 1-15. <https://doi.org/10.1016/j.lindif.2019.101812>

Rosenberg, J. M., +Edwards, A., & Chen, B. (2020). Getting messy with data: Tools and strategies to help students analyze and interpret complex data sources. *The Science Teacher*, 87(5). https://learningcenter.nsta.org/resource/?id=10.2505/4/tst20_087_05_30

- Xu, R., Frank, K. A., Maroulis, S., & Rosenberg, J. M. (2019). konfound: Command to quantify robustness of causal inferences. *The Stata Journal*, 19(3), 523-550. <https://journals.sagepub.com/doi/full/10.1177/1536867X19874223>
- Blondel, D. V., Sansone, A., Rosenberg, J. M., Yang, B. W., Linennbrink-Garcia, L., & Schwarz-Bloom, R. D. (2019). Development of an online experiment platform (Rex) for high school biology. *Journal of Formative Design for Learning*, 3(1) 62-81. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6716597/>
- Henriksen, D., Mehta, R. & Rosenberg, J. (2019). Supporting a creatively focused technology fluent mindset among educators: survey results from a five-year inquiry into teachers' confidence in using technology. *Journal of Technology and Teacher Education*, 27(1), 63-95. <https://www.learntechlib.org/primary/p/184724/>
- Rosenberg, J. M., & +Lawson, M. J. (2019). An investigation of students' use of a computational science simulation in an online high school physics class. *Education Sciences*, 9(49), 1-19. <https://www.mdpi.com/2227-7102/9/1/49>
- Rosenberg, J. M., Beymer, P. N., Anderson, D. J., & Schmidt, J. A. (2018). tidyLPA: An R package to easily carry out Latent Profile Analysis (LPA) using open-source or commercial software. *Journal of Open Source Software*, 3(30), 978. <https://doi.org/10.21105/joss.00978>
- Greenhalgh, S. P., Staudt Willet, K. B., Rosenberg, J. M., & Koehler, M. J. (2018). Tweet, and we shall find: Using digital methods to locate participants in educational hashtags. *TechTrends*, 62(5), 501-508. <https://doi.org/10.1007/s11528-018-0313-6>
- Beymer, P. N., Rosenberg, J. M., Schmidt, J. A., & Naftzger, N. (2018). Examining relationships between choice, affect, and engagement in out-of-school time STEM programs. *Journal of Youth and Adolescence*, 47(6), 1178-1191. <https://doi.org/10.1007/s10964-018-0814-9>
- Akcaoglu, M., Rosenberg, J. M., Ranellucci, J., & Schwarz, C. V. (2018). Outcomes from a self-generated utility value intervention on fifth and sixth-grade students' value and interest in science. *International Journal of Educational Research*, 87, 67-77. <https://www.sciencedirect.com/science/article/pii/S0883035517308492>
- Schmidt, J. A., Rosenberg, J. M., & Beymer, P. (2018). A person-in-context approach to student engagement in science: Examining learning activities and choice. *Journal of Research in Science Teaching*, 55(1), 19-43. <https://dx.doi.org/10.1002/tea.21409> (Note. This article was recognized as one of the 20 most-downloaded articles in JRST between June, 2016 and June, 2018)
- Rosenberg, J.M., Greenhalgh, S.P., Graves Wolf, L. & Koehler, M.J. (2017). Strategies, use, and impact of social media for supporting teacher community within professional development: The case of one urban STEM program. *Journal of Computers in Mathematics and Science Teaching*, 36(3), 255-267. <https://www.learntechlib.org/primary/p/180387/>
- Koehler, M. J., Greenhalgh, S. P., Rosenberg, M. J., & Keenan, S. (2017). What the tech is going on with digital teaching portfolios? Using the TPACK framework to analyze teachers'

technological understanding. *Journal of Technology and Teacher Education*, 25, 31-59. <http://www.learntechlib.org/p/173346/>

Rosenberg, J. M., Greenhalgh, S. P., Koehler, M. J., Hamilton, E., & Akcaoglu, M. (2016). An investigation of State Educational Twitter Hashtags (SETHs) as affinity spaces. *E-Learning and Digital Media*, 13(1-2), 24-44. <http://dx.doi.org/10.1177/2042753016672351>

Greenhalgh, S. P., Rosenberg, J. M., & Wolf, L. G. (2016). For all intents and purposes: Twitter as a foundational technology for teachers. *E-Learning and Digital Media*, 13(1-2), 81-98. <http://dx.doi.org/10.1177/2042753016672131>

Hamilton, E., Rosenberg, J. M., & Akcaoglu, M. (2016). Examining the Substitution Augmentation Modification Redefinition (SAMR) model for technology integration. *Tech Trends*, 60, 433-441. <http://dx.doi.org/10.1007/s11528-016-0091-y>

Rosenberg, J. M., Terry, C. A., Bell, J., Hiltz, V., & Russo, T. (2016). Design guidelines for graduate program social media use. *Tech Trends*, 2, 167-175. <http://dx.doi.org/10.1007/s11528-016-0023-x>

Rosenberg, J. M., & Koehler, M. J. (2015). Context and Technological Pedagogical Content Knowledge (TPACK): A systematic review. *Journal of Research on Technology in Education*, 47, 186-210. <http://dx.doi.org/10.1080/15391523.2015.1052663>

Commissioned Papers and White Papers, Reports, and Articles in the Popular Press (6)

Bilal, D., Fagan, J., Rius, A., Vogiatzis, K., Liu, C., Dahms, H., Duncan, L., Kim, H., Odoi, A., Rosenberg, J., Singh, V., & Sobes, V. (2023). *AI TENNessee Initiative: Education*. *AI Tennessee Initiative*. *N.b.* I co-chaired the committee that wrote this white paper with C. Liu.

Rosenberg, J. M., & Jones, R. S. (2022). *K-12 data science learning*. Paper commissioned by the National Academies of Sciences, Engineering, and Medicine for *Foundations of Data Science for Students in Grades K-12: A Workshop*. <https://www.nationalacademies.org/event/09-13-2022/docs/DD667E469D0EC5DD91A7D85BC839A9852491A3CF9F15>

Rosenberg, J. M. (2021). School posts on Facebook could threaten student privacy. *The Conversation*.

Rosenberg, J. M. (2020). Open-source authorship of data science in education using R. *R Views*. <https://rviews.rstudio.com/2020/07/01/open-source-authorship-of-data-science-in-education-using-r/>

Rosenberg, J. M. (2018). Opportunities for engaging students in “data practices” in online science classes. *Michigan Virtual Learning Research Institute Blog: Research, Policy, Innovation & Networks*. <https://mvlri.org/blog/opportunities-engaging-students-data-practices-online-science-classes/>

Rosenberg, J. M., & Ranellucci, J. (2017). Student motivation in online science courses: A path to spending more time on course and higher achievement. *Michigan Virtual Learning Research Institute Blog: Research, Policy, Innovation & Networks*. <https://mvlri.org/blog/student-motivation-in-online-science-courses-a-path-to-spending-more-time-on-course-and-higher-achievement/>

Naftzger, N., Schmidt, J. A., Shumow, L., Beymer, P. N., & Rosenberg, J. M. (2019). *Exploring the link between STEM activity leader practice and youth engagement: Findings from the STEM IE study*. Washington, DC: American Institutes for Research. <https://www.informalscience.org/exploring-link-between-stem-activity-leader-practice-and-youth-engagement-findings-stem-ie-study>

Editor-Reviewed Articles Published in Journals (11)

Allman, B., Kimmons, R., +Wang, W., +Bao, H., Rosenberg, J. M., & Koehler, M. J. (2024). Trends and topics in educational technology, 2024 edition. *TechTrends*. <https://doi.org/10.1007/s11528-024-00950-5>

Allman, B., Kimmons, R., Rosenberg, J., & Dash, M. (2023). Trends and Topics in Educational Technology, 2023 Edition. *TechTrends*, 67(3), 583-591.

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Jiang, S., Lee, V. R., & Rosenberg, J. M. (2022). Data science education across the disciplines: Underexamined opportunities for K-12 innovation. *British Journal of Educational Technology*, 53(5), 1073-1079. <https://bera-journals.onlinelibrary.wiley.com/doi/full/10.1111/bjet.13258>

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Dai, T., Rosenberg, J. M., & +Lawson, M. A. (2022). Data representations and visualizations in educational research. In T. L. Good & M. McCaslin (Eds.), *Educational Psychology Section*; D. Fisher (Ed.), *Routledge encyclopedia of education*. Taylor & Francis: New York, NY. <https://doi.org/10.4324/9781138609877-REE148-1>

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Lishinski, A., Narvaiz, S., and Rosenberg, J. M. (2022). Self-efficacy, interest, and belongingness – URM Students' momentary experiences in CS1. *Proceedings of the 2022 ACM Conference on International Computing Education Research* (ICER '22). <https://dl.acm.org/doi/abs/10.1145/3501385.3543958>. *Note.* Unlike most of academia, premiere conferences in computing education are selective venues for archival research. Thiese conference proceedings exceed many journals in their selectivity, visibility, and impact.

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- Rosenberg, J. M., Galas, E., & Staudt Willet, K.B. (2021). Who are the data scientists in education? An investigation of the identities and work of individuals in diverse roles. In E. de Vries, Y. Hod, & J., Ahn (Eds.), *The International Society of the Learning Sciences 2020 Conference Proceedings* (pp. 1057-1058). International Society of the Learning Sciences. <https://repository.isls.org/handle/1/7394>
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- Rosenberg, J. M., & Staudt Willet, K. B. (2021). Advancing social influence models in learning analytics. *Companion proceedings of the 11th International Conference on Learning Analytics & Knowledge (LAK21)*. http://ceur-ws.org/Vol-2868/article_2.pdf
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Rosenberg, J. M. (2020). More confidently uncertain? Teaching learners to apply Bayesian methods to make sense of scientific phenomena. In M. Gresalfi and I. Horn (Eds.), *The Interdisciplinarity of the Learning Sciences: The International Conference of the Learning Sciences 2020 Conference Proceedings* (Vol 5., pp. 2681-2682). ISLS.

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Schwarz, C. V., Ke, L., Lee, M., & Rosenberg, J. M. (2014). Developing mechanistic explanations of phenomena: Case studies of two fifth grade students' epistemologies in practice over time. In J. L. Polman, E. A. Kyza, K. O'Neill, I. Tabak, W. R. Penuel, A. S. Jurow, . . . L. D'Amico (Eds.), *Learning and becoming in practice: The international conference of the learning sciences (ICLS) 2014* (Vol. 1, pp. 182-189). Boulder, CO: ISLS. <http://www.isls.org/icls2014/Proceedings.html>

Rosenberg, J. M., & Koehler, M. (2014). Context and Technological Pedagogical Content Knowledge: A content analysis. In M. Searson & M. Ochoa (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2014* (pp. 2412-2417). Chesapeake, VA: AACE. Retrieved from <http://www.editlib.org/p/131183>

Greenhalgh, S. P., Rosenberg, J. M., Zellner, A. & Koehler, M. J. (2014). Zen and the art of portfolio maintenance: Best practices in course design for supporting long-lasting portfolios. In M. Searson & M. Ochoa (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2014* (pp. 1604-1610). Chesapeake, VA: AACE. Retrieved from <http://www.editlib.org/p/131027>

Rosenberg, J., Terry, C., Bell, J., Hiltz, V., Russo, T. & The EPET Social Media Council (2014). What we've got here is failure to communicate: Social media best practices for graduate school programs. In M. Searson & M. Ochoa (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2014* (pp. 1210-1215). Chesapeake, VA: AACE. Retrieved from <http://www.editlib.org/p/130949>

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Presentations

Information on all presentations are provided [here](#); below is a selection of presentations.

Invited Talks

Rosenberg, J. M. (April, 2021). *AI and ML and data! Oh my! Supporting teachers' and learners' work by considering the human sides of data science.* Keynote presentation at the

LEAD Graduate School and Research Network retreat. The University of Tübingen, Baden-Württemberg, Germany.

Rosenberg, J. M. (October, 2021). *All together now: Leveraging data science techniques alongside traditional approaches to understand learning*. Invited presentation at the International Conference on Education Research. Seoul National University, Seoul, South Korea.

Rosenberg, J. M. (February, 2020). *Studying education-focused Twitter hashtags in light of state-based and national policies and practices*. Presentation at the 2020 Spring Seminar Series at the Martin School of Public Policy at the University of Kentucky, Lexington, KY.

Rosenberg, J.M. (September, 2019). *Making data science education count: Exploring the integration of data science into education*. Presentation at the Middle Tennessee State University Mathematics and Science Education Doctoral Seminar series. Middle Tennessee State University, Murfreesboro, TN.

Rosenberg, J. M. (February, 2019). *Making sense of recent advances in the Technological Pedagogical Content Knowledge framework*. English International Congress at the Universidad Técnica del Norte, Ibarra, Ecuador.

Select Workshops

Rosenberg, J. M. & D'Angelo, C. (2022, March). *An Introduction to Data Science in Science Education Using R*. National Association for Research in Science Teaching. Note. This session was sponsored by the Contemporary Methods Research Interest Group (RIG).

Kellogg, S., Jiang, S., Moore, R., & Rosenberg, J. M. (2021, August). *A LASER Focus on Understanding and Improving STEM Education*. Partnerships for Expanding STEM Education Research in STEM (AERA & ICPSR). <https://github.com/laser-institute/aera-workshop>

Rosenberg, J. M. (2021, July). *An Introduction to Natural Language Processing in Science Education*. Workshop carried out at the [Machine Learning and Computer-Based Text Analysis conference](#), Kiel, Germany. <https://joshuaamrosenberg.com/post/2021/07/19/an-introduction-to-natural-language-processing-in-science-education/>

Select Outreach and Community Engagement

Rosenberg, J. M. (2021, August). *Tools and Strategies to Work with Data in the Science Classroom*. Knox County Schools District Learning Day. <https://bit.ly/kcs-dld>

D'Angelo, C., & Rosenberg, J. M. (2021, April). *Analyzing Education Data with Open Science Best Practices, R, and OSF*. Webinar through the Center for Open Science. <https://www.youtube.com/watch?v=WxdWzTlzYmI>

Teaching

Teaching Awards

MSU-AT&T Instructional Technology Award: Best Online Course, 2014

Courses Taught

Instructor at the University of Tennessee, Knoxville:

Foundations of Educational Data Science I (TPTE 680, M.A. and Ph.D. class)

Foundations of Educational Data Science II (STEM 685, M.A. and Ph.D. class) *Visualizing Data Using R* (STEM 691, M.A. and Ph.D. class)

Capstone in Educational Data Science (STEM 695, M.A. and Ph.D. class)

STEM Education Seminar (STEM 612, Ph.D. class). *Trans-Departmental Seminar II* (TPTE 605, Ph.D. class)

Nature of Mathematics and Science Education (SCED 572, M.A. and Ph.D. class)

Teaching Science in Grades 7-12 (TPTE 495, SCED 496, & SCED 543, B.S. & M.A. class)

VolsTeach Step 1 and Step 2 (TPTE 110 & TPTE 120, undergraduate-level class)

Instructor at Michigan State University:

Psychology of Learning in School and Other Settings (CEP 800, M.A. class)

Approaches to Educational Research (CEP 822, M.A. class)

Technology and Leadership (CEP 815, M.A. class)

Service

Editorial Service

Associate Editor, *Journal of Statistics and Data Science Education*, 2023 - Present

Editorial Review Board Member, *Review of Educational Research*, 2022 - Present

Editorial Review Board Member, *Journal of Research on Technology in Education*, 2016 - Present

Editorial Review Board Member, *Contemporary Issues in Technology and Teacher Education (Science Education Section)*, 2019 - 2022

Special Section Editor, *British Journal of Educational Technology*, 2022

Editorial Review Board Member, *Journal of Research in Science Teaching*, 2019-2022

Special Issue Editor, *Australasian Journal of Educational Technology*, 2017

Service to the Profession

External Reviewer, Application for Promotion to Associate Professor, Texas Tech, 2024

Ad-Hoc Reviewer, Building Capacity in STEM Education Research (one proposal), National Science Foundation, *n.d.*

Ad-Hoc Reviewer, Discovery Research K-12 (three proposals), National Science Foundation, *n.d.*

Ad-Hoc Reviewer, Advancing Informal STEM Learning, National Science Foundation (one proposal), *n.d.*

Panelist, Innovative Technology Experiences for Students and Teachers (ITEST), National Science Foundation, *n.d.* (two panels)

Panelist, Building Capacity in STEM Education Research (BCSER), National Science Foundation, *n.d.*

Panelist, Discovery Research PreK-12 (DRK-12), National Science Foundation, *n.d.*

External Reviewer, Application for Promotion to Professor, Elon University, 2021

Member, OpenSciEd Research Agenda (Assessment) working group, 2021

Service to the Community

Mentor, TN Promise (2022-2023; mentor to 12 college-going students)

Mentor, Diversity in Learning Analytics and Leadership program, <https://www.diversityindataandleadershipprogram.com/>

Reviewer, Proposals from Knox County Schools students for the NASA Student Spaceflight Experiment program

Selected Ad-hoc Journal Article Reviewing

- AERA Open
- British Journal of Educational Technology
- Cognition & Instruction
- Computers & Education

- Contemporary Educational Psychology
- Educational Researcher
- Educational Psychologist
- Educational Technology Research & Development

- Journal of the Learning Sciences
- Journal of Open Source Software
- Science Education
- TechTrends
- Urban Education

University service

2023-2025, Data Science Curriculum Committee Chair, College of Emerging and Collaborative Studies, UTK

2022-2023, AI Visioning Working Group (Co-Chair, Education Committee), AI Tennessee Initiative, UTK

2021-2023, Data Science Faculty Committee member, UTK

College-related Service

2023-2024, Search Chair, Unit Head, *Department of Theory and Practice in Teacher Education*, UTK

2023-2024, Search Co-Chair, Assistant/Associate Professor of Educational Data Science, *Department of Theory and Practice in Teacher Education*, UTK,

2021-2022, Search Committee Member, Two Tenure Track positions in Learning Design and Technology and Instructional Technology, *Department of Educational Psychology and Counseling*, UTK

Departmental Service

University of Tennessee, Knoxville

2022-, STEM Education Seminar Ad-Hoc Committee Chair, TPTE, UTK

2021-, Institutional Review Board Departmental Representative (Quantitative), TPTE, UTK

Program Service and Service on Student Committees

University of Tennessee, Knoxville

Advisor for Doctoral students:

- 2023-: Cody Pritchard
- 2021-: Amanda Garner
- 2021-: Emily McDonald
- 2020-: Omiya Sultana
- 2023-: Wei Wang
- 2023-: Hanhui Bao
- 2019-2021: Jennifer Longnecker (graduated 2021)

Committee Member for Doctoral students:

- 2019-2023: Maryrose Weatherton (Department of Ecology and Evolutionary Biology, UTK)
- 2022-: Amanda Zeller (TPTE)
- 2020-2022: Anthony Schmidt (Department of Educational Psychology & Counseling, UTK)
- 2021-: Donna Wortham (Educational Leadership & Policy Studies, UTK)
- 2020-2023: Sarah Narvaiz (Department of Educational Psychology & Counseling, UTK)
- 2021-2023: Anna Sintsova Banks (Department of Educational Psychology & Counseling, UTK)
- 2021-: John Mooneyham (TPTE)
- 2019-2021: Matthew Hensley (graduated 2021)
- 2018-2020: Shande King (graduated 2020)

Miscellaneous

Software Developed

Rosenberg, J. M., van Lissa, C. J., Beymer, P. N., Anderson, D. J., Schell, M. J. & Schmidt, J. A. (2019). *tidyLPA: Easily carry out Latent Profile Analysis (LPA) using open-source or commercial software* [R package]. <https://data-edu.github.io/tidyLPA/>

Rosenberg, J. M., Xu, R., & Frank, K. A. (2019). *konfound: Quantify the robustness of causal inferences* [R package]. <https://jrosen48.github.io/konfound/>

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Rosenberg, J. M., & Krist, C. (2019). *Generality embedded assessment classifier*. <https://faast.shinyapps.io/generality-shiny>

Estrellado, R. A., Bovee, E. A., Mostipak, J., Rosenberg, J. M., & Velásquez, I. C. (2019). *dataedu: Package for Data Science in Education Using R*. <https://github.com/data-edu/dataedu>

Rosenberg, J. M. (2020). *tidykids: State-by-State Spending on Kids Dataset*. <https://jrosen48.github.io/tidykids/>

Lishinski, A., & Rosenberg, J. M. (2019). *Short message survey: An open-source, text-message based application for the experience sampling method*. <https://github.com/picsul/short-message-survey>

Rosenberg, J. M. (2016). *Diffusion & temperature. Lab Interactive Simulation*. <https://lab.concord.org/interactives.html#interactives/external-projects/msu/temperature-diffusion.json>

Invited Participation in Workshops/Working Groups

Invited Participant, *Advancing Critical Social Network Analysis to Address Issues of Equity in Education Policy and Politics*, Spencer Foundation, 2023

Invited Participant, *National Academy of Science - National Science Foundation Working Group - Tools & Transfer*, Data Science for Everyone, 2023

Invited Participant, *Foundations of data science for students in grades K-12: A workshop*, National Academies of Sciences, Engineering and Medicine, 2022

Invited Participant, *Open Scholarship in Education small expert meeting*, Center for Open Science, 2022

Invited Participant, *New applications of social network analysis to education policy: Building the capacity of the field*, Spencer Foundation, 2021

Invited Participant, *Data4Kids: Virtually teaching kids about data science*, Urban Institute, 2021

Competitive Research Training

Early Career Workshop, International Conference of the Learning Sciences, 2020

New Faculty Mentoring Program, AERA Division C, 2019

Media Coverage

[Outsmart ChatGPT: 8 Tips for Creating Assignments It Can't Do](#), *Education Week*, February 14, 2023

[Can Digital Tools Detect ChatGPT-Inspired Cheating?](#), *Education Week*, January 27, 2023

[When Does Posting Photos of Students Become a Data Privacy Problem?](#), *EdSurge*, January 9, 2023

[How School Social Media Accounts Put Student Privacy at Risk](#), *Tech & Learning*, November 30, 2022

[Professors publish playbook for how teachers can address parents concerned about CRT](#), *Fox News*, November 13, 2022

[Study: School Facebook Pages May Compromise Student Privacy](#), *Government Technology*, November 10, 2022

[Study Shows Millions of Student Privacy Breaches on Social Media](#) *THE Journal*, November 7, 2022

[School Facebook Pages and Privacy Concerns: What Educators Need to Know](#) *Education Week*, November 2, 2022

[Study: Schools' Facebook posts may violate student privacy](#) *K-12 Dive*, November 2, 2022

[Study: Schools' Social Media Posts May Be Compromising Student Privacy](#), *American Educational Research Association*, November 2, 2022

[The Tricky Ethics of Being a Teacher on TikTok](#), *Wired*, September 6, 2022

[Teaching Students to Understand the Uncertainties of Science Could Help Build Public Trust](#), *Education Week*

[School Posts on Facebook Could Threaten Student Privacy](#), *Tennessee News Service*

Teaching R to 7th Graders, *Flowing Data*

Podcasts

2021-, Co-host, *About Practice* podcast, <https://anchor.fm/about-practice>

2021, Full Stack Education podcast, <https://www.fullstackeducator.com/show-notes/season-2-episode-15-ryan-estrellado-and-joshua-rosenberg-data-science-in-education>

2021, Visions of Education podcast, <https://visionsofed.com/2021/05/27/episode-166-data-science-in-education-with-ryan-estrellado-jesse-mostipak-and-joshua-rosenberg/>

2020, Education Data Chat podcast, <https://www.buzzsprout.com/1074286/4993430>

2018-2019, Co-host, *Impodster Syndrome* podcast, <https://drive.google.com/drive/folders/1fwSaEKt9QzJPUIf-CYVVwPgN-pKBaAkW?usp=sharing>

2016, Innovative Education in VT, <https://tiie.w3.uvm.edu/blog/educators-on-twitter/#.XzkFq5NKiHE>

Consultant and Advisory Board Member Roles

2023-2026, Data Science Assessment Consultant, *NSF AISL: Integrating Research and Practice: Reimagining Youth Community Science through Make-and-Take Data Sensing Kits*, NSF grant no. [2314089](#). Blikstein, P. & Perez, S. (PIs)

2023-2025, Advisory Board Member, *Integration of Computer-Assisted Methods and Human Interactions to Understand Lesson Plan Quality and Teaching to Advance Middle-Grade Mathematics Instruction*. Min Sun (PI). NSF Grant No. [2300291](#).

2023-2025, Advisor, *Sloan: Aligning Graduate Education and Workforce Opportunities: A Robust, Equity-Focused Landscape Scan of Computing Terminology*. Wofford, A., Perez-Felkner, L., & Staudt Willet, K. B. (PIs). Funded by Alfred P. Sloan Foundation.

2023 - 2026, Consultant, *WTG: Diffusion of Research on Supporting Mathematics Achievement for Youth with Disabilities through Twitter Translational Visual Abstracts*, Jessica Rodrigues (PI, University of Missouri), National Science Foundation, https://www.nsf.gov/awardsearch/showAward?AWD_ID=2244734&HistoricalAwards=false

2023 - 2025, Consultant, *Forschen mit epidemischer Unsicherheit Lernen (Project FEUL)* (Learning to do investigations with epistemic uncertainty), Marcus Kubsch (PI; IPN - Leibniz Institute, Kiel, Germany), Joachim Herz Foundation

2022-2024, Participating Faculty, *Bayesian Thinking in STEM*, (NSF Grant No. [2215879](#)), <https://www.stat.uci.edu/bayes-bats/>

2022-2027, Advisory Board Member, *Collaborative Research: Enhancing Data Science and Statistics Teacher Education—Transforming and Building Community*, Hollylynne Lee (PI; North Carolina State University), National Science Foundation. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2141727&HistoricalAwards=false

2022-2025, Advisory Board Member, *A Learning Ecosystem for Teaching High School Students Machine Learning Concepts and Data Science Skills in Healthcare and Medicine*, Kathryn Eller (PI; East Bay Educational Collaborative), National Science Foundation. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2148451&HistoricalAwards=false

2022-2025, Advisory Board Member, *Mathematizing, Visualizing, and Power (MVP): Appalachian youth becoming data artists for community learning*, Lynn Hodge (PI), National Science Foundation, https://www.nsf.gov/awardsearch/showAward?AWD_ID=2215004&HistoricalAwards=false

2021-2026, Advisory Board Member, *SEER Research Network for Digital Learning Platforms*, Jeremy Roschelle (PI; Digital Promise), Institute for Education Sciences, Digital Learning Platforms to Enable Efficient Education Research Network

2021-2022, Lead STEM Education Consultant, *Supporting Students' Meaningful Engagement With Data From Small Orbiting Satellites*, Art Palisoc (PI), STEM Ed LLC, NSF Phase I SBIR, *STEM Experiments and Games in Low Earth Orbit – Making STEM Learning Fun*

Professional Affiliations

American Educational Research Association
International Society of the Learning Sciences
Learning Analytics & Knowledge
National Association for Research in Science Teaching