

Li Ke (柯立), PhD

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EDUCATION

- Ph.D. Curriculum, Instruction, and Teacher Education, 2018

Michigan State University, East Lansing, MI
Area of Specialization: Science Education
Title: *Examining teacher support for meaningful engagement in scientific modeling*
Dissertation co-chairs: Joseph S. Krajcik & Christina V. Schwarz
- M.S. Curriculum and Instruction, 2012

University of Wisconsin-Madison, Madison, WI
Area of Concentration: Science Education
- B.S. Chemistry, 2010

Fudan University, Shanghai, China

PROFESSIONAL EXPERIENCE

University Of North Carolina at Chapel Hill

- 2020- Managing Editor, *Journal of Research in Science Teaching*
2019- Postdoctoral Research Associate, School of Education

University Of North Carolina at Greensboro

- 2018-2019 Postdoctoral Research Associate, School of Education

Michigan State University

- 2012-2018 Graduate Research and Teaching Assistant, College of Education

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GRANTS

2021-2025, Co-Principal Investigator, *Learning about Viral Epidemics through Engagement with Different Types of Models* (\$1,886,928; PI: Troy D. Sadler, Co-PI: Li Ke, Laura Zangori, & Patricia Friedrichsen). The Discovery Research PreK-12 program, National Science Foundation (Grant No. 2101083).

PENDING GRANTS

2022-2026, Co-Principal Investigator, *Restructuring Middle School Science around Grand Challenges* (\$2,086,237; PI: Troy D. Sadler, Co-PIs: Li Ke & David Fortus). The Discovery Research PreK-12 program, National Science Foundation.

2022-2023, Principal Investigator, *Emergent Bilingual Students Coordinating Different Types of Models in the Context of COVID-19* (\$10,000). The International Society of the Learning Sciences (ISLS) Emerging Scholars Program, The Wallace Foundation.

PUBLICATIONS

Referred Journal Articles

Ke, L., & Schwarz, C. V. (2021). Supporting students' meaningful engagement in scientific modeling through epistemological messages: A case study of contrasting teaching approaches. *Journal of Research in Science Teaching*, 58(3), 335-365.

Ke, L., Sadler, T. D., Zangori, L., & Friedrichsen, P. (2021). Developing and using multiple models to promote scientific literacy in the context of socio-scientific issues. *Science & Education*, 30(3), 589-607.

Friedrichsen, P., **Ke, L.,** Sadler, T. D., & Zangori, L. (2021). Enacting co-designed socio-scientific issue-based curriculum units: A case study of secondary science teacher learning. *Journal of Science Teacher Education*, 32(1), 85-106.

Li, N., **Ke, L.,** Liu, E., Sadler, T. D., & Li, X. (2021). Value analysis of socio-scientific issues in Chinese secondary science education. *Journal of China Examinations*, 8, 87-94. (社会性科学议题在我国中学科学教育中的价值分析。《中国考试》)

Ke, L., Sadler, T. D., Zangori, L., & Friedrichsen, P. (2020). Students' perceptions of engagement in socio-scientific issue-based learning and their appropriation of epistemic tools for systems thinking. *International Journal of Science Education*, 42(8), 1339-1361.

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Zangori, L., **Ke, L.**, Sadler, T. D., & Peel, A. (2020). Exploring primary students causal reasoning about ecosystems. *International Journal of Science Education*, 42(11), 1799-1817.

Sadler, T. D., Friedrichsen, P., Zangori, L. & **Ke, L.** (2020). Technology-supported professional development for collaborative design of COVID-19 instructional materials. *Journal of Technology and Teacher Education*, 28(2), 171-177.

Alonzo, A., & **Ke, L.** (2016). Taking stock: Existing resources for assessing a new vision of science learning. *Measurement: Interdisciplinary Research and Perspectives*, 14(4), 119-152.

Book Chapters

Ke, L., Zangori, L., Sadler, T.D., & Friedrichsen, P. (2020). Integrating scientific modeling and socio-scientific reasoning to promote scientific literacy. In Powell, W. (Ed.), *Socio-scientific issue-based instruction for scientific literacy development* (pp. 31-55). IGI Global.

Ke, L., & Schwarz, C.V. (2019). Using epistemic considerations in teaching: Fostering students' meaningful engagement in scientific modeling. In Upmeier zu Belzen, A., Krüger, D. & Van Driel, J. (Eds.), *Towards a competence-based view on models and modeling in science education* (pp. 181-199). Switzerland: Springer International Publishing.

Conference Proceedings

Zangori, L., **Ke, L.**, Sadler, T., & Peel, A. (2020). Supporting Elementary Learners to Explore Causal Interaction Patterns. In Gresalfi, M. and Horn, I. S. (Eds.), *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1* (pp. 541-544). Nashville, Tennessee: International Society of the Learning Sciences.

Ke, L., & Schwarz, C. (2016). Examining the influences of teacher's framing of modeling practices on elementary students' engagement in scientific modeling. In Looi, C., Polman, J., Cress, U., & Reimann, P. (Eds.), *Transforming Learning, Empowering Learners: Proceedings of the 12th International Conference of the Learning Sciences (2)*. Singapore.

Schwarz, C., **Ke, L.**, Lee, M., & Rosenberg, J. (2014). Developing mechanistic explanations of phenomena: Case studies of two fifth grade students' epistemologies in practice over time. In Polman, J., Kyza, E., O'Neil, D., Tabak, I., Penuel, W., Jurow, A., O'Connor, K., Lee, T., & D'Amico, L. (Eds.). *Learning and becoming in practice: The International Conference of the Learning Sciences (1)*. Boulder, CO.

LI KE**GRANT-RELATED RESEARCH EXPERIENCE**

- 2020-2021 Postdoctoral Research Associate
- Responding to an Emerging Epidemic through Science Education* (2020-2021). National Science Foundation (RAPID). \$200,000. Sadler, T. D. (PI); Friedrichsen, P., & Zangori, L. (Co-PIs).
- 2018-2021 Postdoctoral Research Associate
- High School Students' Climate Literacy through Epistemology of Scientific Modeling* (2017-2021). National Science Foundation (DRK-12). \$1,688,931. Forbes, C. (PI); Chandler, M. (Co-PI).
- 2018-2019 Postdoctoral Research Associate
- Exploring the Integration of Computational Thinking into Preservice Elementary Science Teacher Education* (2017-2019). National Science Foundation (STEM+C). \$1,237,100. Ketelhut, D. (PI); Plane, J., McGinnis, R., & Sadler, T. D. (Co-PIs).
- 2015-2018 Graduate Research Assistant
- Supporting Secondary Students in Building External Models* (2014-2019). National Science Foundation (DRK-12). \$2,745,582. Krajcik, J. (PI); Damelin, D. (Co-PI).
- 2012-2016 Graduate Research Assistant
- Supporting Scientific Practices in Elementary and Middle School Classrooms* (2010-2017). National Science Foundation (DRK-12). \$3,495,230. Reiser, B. (PI); Schwarz, C., Kenyon, L., & Berland, L. (Co-PIs).

CONFERENCE PRESENTATIONS & WORKSHOPS

- Ke, L.,** Zangori, L., Sadler, T.D., & Friedrichsen, P. (2021, April). Integrating scientific modeling and socio-scientific reasoning to promote scientific literacy. Paper presented at NARST Annual International Conference (conference shifted to virtual due to COVID-19)
- Ke, L.,** Sadler, T. D., Zangori, L., & Friedrichsen, P. J. Developing and using multiple models to promote scientific literacy (2021, April). Paper presented at NARST Annual International Conference (conference shifted to virtual due to COVID-19)

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- Sadler, T. D., Friedrichsen, P., **Ke, L.**, & Zangori, L. (2021, April). Enacting Co-designed socio-scientific issues-based curriculum units: A case of secondary science teacher learning. Paper presented at AERA Annual Meeting (conference shifted to virtual due to COVID-19).
- Sadler, T. D., Friedrichsen, P., Zangori, L., & **Ke, L.** (2021, April). Responding to an emerging epidemic through science education. Paper presented at AERA Annual Meeting (conference shifted to virtual due to COVID-19).
- Ke, L.**, Sadler, T. D., Zangori, L., & Friedrichsen, P. (2020, March). Students' perceptions of socio-scientific issue-centered learning and their appropriation of epistemic tools for systems thinking. Paper scheduled to be presented at NARST Annual International Conference, Portland, OR (conference cancelled due to COVID-19).
- Friedrichsen, P., **Ke, L.**, Sadler, T. D., Zangori, L., & Dawson, V. (2020, March). Co-designed socio-scientific issues-based curriculum unit implementation: A case study of secondary science teacher learning. Paper scheduled to be presented at NARST Annual International Conference, Portland, OR (conference cancelled due to COVID-19).
- Zangori, L., **Ke, L.**, & Sadler, T. D. (2020, March). Developing systems thinking through modeling in the context of socio-scientific issues among elementary learners. Paper scheduled to be presented at NARST Annual International Conference, Portland, OR (conference cancelled due to COVID-19).
- Sadler, T. D., & **Ke, L.** (2020, March). What is the science curriculum of today and the future? Paper scheduled to be presented at NARST Annual International Conference, Portland, OR (conference cancelled due to COVID-19).
- Fan, N., Xiao, S., & **Ke, L.** (2020, March). Socioscientific topics or issues, and why this distinction matters: A critical review. Paper presented at NARST Annual International Conference, Portland, OR (conference cancelled due to COVID-19).
- Zhao, P., Zhou, G., **Ke, L.**, & Liu, E. (2019, April). Developing teacher education course to support Chinese Biology preservice teachers in scientific modeling. Poster presented at the NARST Annual International Conference, Baltimore, MD.
- Ke, L.**, Friedrichsen, P., Zangori, L., Sadler, T. D., Peel, A., & Dryer, E. (2019, January). Secondary science teachers' implementing co-designed socio-scientific issues-based curriculum units: Supports, challenges, and salient outcomes. Paper presented at the Association of Science Teacher Education Conference, Savannah, GA.
- Bielik, T., **Ke, L.**, & Krajcik, J. (2018, June). Supporting students' modeling practices using an online computational modeling tool. Pre-conference workshop at the International Conference of the Learning Sciences, London, United Kingdom.

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- Bielik, T., & **Ke, L.** (2018, March). Using an online modeling tool to develop students' modeling knowledge. Paper presented at the NARST Annual International Conference, Atlanta, GA.
- Ke, L.**, Bielik, T., & Damelin, D. (2017, August). Engaging students in building computational models using an online modeling tool. Workshop at Kellogg Biological Station K-12 Summer Institute. W.K. Kellogg Biological Station, Michigan State University.
- Schwarz, C., & **Ke, L.** (2017, April). Longitudinal analysis of upper elementary and middle school students' modeling practices. In Karan, A. (session organizer), *Supporting Science as a Modeling Practice in Classroom through the Lens of NGSS*. Poster presented at AERA Annual Meeting, San Antonio, TX.
- Ke, L.**, & Stephens, L. (2017, April). Explanations and relationships in students' mental and external models. Paper presented at the NARST Annual International Conference, San Antonio, TX.
- Krajcik, J., Bielik, T., **Ke, L.**, & Damelin, D. (2017, March). Using a free online tool to support students in developing models. Hands-on teacher workshop at National Science Teachers Association (NSTA) National Conference on Science Education, Los Angeles, CA.
- Ke, L.**, & Schwarz, C. (2016, June). Examining the influences of teacher's framing of modeling practices on elementary students' engagement in scientific modeling. Paper presented at the International Conference of the Learning Sciences, Singapore.
- Ke, L.**, & Schwarz, C. (2016, April). Teachers' messages about modeling: A case study of two elementary teachers. Paper presented at the NARST Annual International Conference, Baltimore, MD.
- Ke, L.**, Schwarz, C., & Richmond, G. (2015, April). Examining the teacher's role in supporting elementary students' meaningful engagement in scientific modeling. Paper presented at the NARST Annual International Conference, Chicago, IL.
- Ke, L.**, Schwarz, C., Lee, M., & Rosenberg, J. (2014, April). Examining elementary students' attention to mechanism as they engage in scientific modeling across content areas. Paper presented at the NARST Annual International Conference, Pittsburgh, PA.
- Schwarz, C., **Ke, L.**, Lee, M., & Rosenberg, J. (2014, June). Developing mechanistic explanations of phenomena: Case studies of two fifth grade students' epistemologies in practice over time. Paper presented at the International Conference of the Learning Sciences, Boulder, CO.
- Lee, M., Schwarz, C., **Ke, L.**, & Rosenberg, J. (2014, April). Analyzing fifth-grade students' engagement in scientific modeling: Changes in students' epistemologies-in-practice over time. Paper presented at the NARST Annual International Conference, Pittsburgh, PA.

LI KE**INVITED PRESENTATIONS & TALKS**

Ke, L. (2021, September). Writing for peer-reviewed academic journals from the perspective of editors and reviewers. Invited virtual talk at Research Institute of Science Education, Beijing Normal University, China

Ke, L. (2021, September). Qualitative research and publication. Invited webinar, Wiley Online Library.

Ke, L. (2020, August). Using socio-scientific issues for teaching science. Invited virtual talk at Collaborative Innovation Center of Assessment for Basic Education Quality, Beijing Normal University, China

Ke, L. (2019, November). Curriculum integration for scientific literacy and social responsibility: A case study of students' perceptions of learning through a socio-scientific issue-based unit. Keynote speaker at the 17th Shanghai International Curriculum Forum, East China Normal University, China.

Ke, L. (2019, October). Co-design for teacher learning: Supporting secondary science teachers in enacting socio-scientific issue-based teaching. Invited talk at Research Center of Teacher Education, Beijing Normal University, China.

Ke, L. (2019, October). Supporting students in meaningful science learning to promote scientific literacy. Invited talk at Improving Scientific Literacy Forum, Beijing Normal University, China.

AWARDS & FELLOWSHIPS

2021	Postdoc Award for Research Excellence, University of North Carolina at Chapel Hill (\$1,200)
2020	Early-Career Scholar Travel Award, European Science Education Research Association (€1,000)
2017	Sandra K. Abell Institute for Doctoral Students, National Association for Research in Science Teaching
2016	Teacher Education Endowed Fellowship, Michigan State University (\$3,600)
2014	Fellowship to Enhance Global Understanding, Michigan State University (\$3,400)

LI KE**TEACHING EXPERIENCE**

Graduate-Level

2020-2021 Instructor, Master of Arts in Teaching (MAT) program, School of Education,
University of North Carolina at Chapel Hill

EDUC 760: Advanced Methods for Teaching Secondary Subjects (Fall,
2020)

EDUC 628: Teaching English Language Learners (Summer, 2021)

Undergraduate-Level

2014-2016 Graduate Teaching Assistant, Secondary Science Teacher Preparation
Program, College of Education, Michigan State University

TE 408: Crafting Teaching Practices (Spring, 2016)

TE 407: Learning to Teach Science in Diverse Contexts (Fall, 2015)

TE 804: Reflection and Inquiry in Teaching Practice II (Spring, 2015)

TE 802: Reflection and Inquiry in Teaching Practice I (Fall, 2014)

2012-2013 Graduate Teaching Assistant, Elementary Science Teacher Preparation
Program, College of Education, Michigan State University

TE 804: Reflection and Inquiry in Teaching Practice II (Spring, 2013)

TE 401: Teaching of Subject Matter to Diverse Learnings (Fall, 2012)

2012 Graduate Teaching Assistant, Department of Chemistry, University of
Wisconsin-Madison

CHEM 104: General Chemistry II (Spring, 2012)

K-12 Classrooms

2011-2012 Teaching Assistant, ESL sheltered science class
East High School, Madison, WI

2009-2010 High School Teacher, 10th grade chemistry
Shanghai Foreign Language School, Shanghai, China

Teacher Certification

2009 Shanghai High School Single Subject Credential – Chemistry (Specialized)

LI KE**PROFESSIONAL SERVICE**

Advising and Mentoring

2020 Mentor, NARST Graduate Student Research Symposium
(Mentee: Caitlin Fine, doctoral student at the University of Colorado, Boulder)

Professional Organization Service

2022-2025 Committee Member, NARST Publication Advisory Committee

2019-2022 Committee Member, NARST Research Committee

2020-2022 Strand 10 Coordinator, NARST Program Committee

Editorial Service

2020-2025 Managing Editor, *Journal of Research in Science Teaching*

2021-2023 Editorial Board Member, *Journal of Science Teacher Education*

2021-2024 Editorial Board Member, *Disciplinary and Interdisciplinary Science Education Research*

Journal Article Review

Journal of Research in Science Teaching (2019, 2020, 2021)

International Journal of Science Education (2020, 2021)

Science & Education (2020, 2021)

International Journal of Science and Mathematics Education (2020, 2021)

Disciplinary and Interdisciplinary Science Education Research (2021)

ECNU Review of Education (2020)

Eurasia Journal of Mathematics, Science and Technology (2019)

Departmental Service

2014-2015 Mentoring Committee, College of Education, Michigan State University

Other Service

2016-2017 M-STEP New Michigan K-12 Science Standards Assessment Item Writer
Office of Standards and Assessment, Michigan Department of
Education

Grade 5-Energy (June 2016), Grade 11-Energy (July 2017)