Cat Maiorca

Assistant Professor of STEM Education
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Department of Elementary Education cat.maiorca@csun.edu

ACADEMIC BACKGROUND

May 2016 **Ph.D. Curriculum and Instruction**
University of Nevada, Las Vegas Las Vegas, NV
Specialization: Mathematics Education
Dissertation Title: *A Case Study: Students' Mathematics-Related Beliefs from Integrated STEM Model-Eliciting Activities*

HONORS

- 2018 Association of Mathematics Teacher Educators STaR Fellow
- 2020 School Science and Mathematics Association Early Career Scholar Award
- 2021 California State University College of Education Outstanding Research Award
- 2023 School Science and Mathematics Association Award for Excellence in Integrating Science and Mathematics
- 2024 Society for Information Technology & Association of Mathematics Teacher Educators Teacher Education National Leadership Technology Initiative Fellowship
- 2024 International Technology and Engineering Educators Association Elementary STEM Council Leadership Award

PROFESSIONAL WORK EXPERIENCE

California State University, Northridge
Northridge, CA
8/2024 to Present Assistant Professor of STEM Education

Oklahoma State University
Stillwater, OK
8/2022 to 8/2024 Assistant Professor Mathematics Education

California State University, Long Beach
Long Beach, CA
8/2016 – 6/2022 Assistant Professor of Elementary Mathematics Education

PUBLICATIONS

Peer-Reviewed Journal Articles

Maiorca, C., Burton, M., Ivy, J., Schroeder, C., Cook, K., Bush, S., Jackson, C., Mohr Schroeder, M., & Edelen, D., Schroeder (Under review). *Artificial and intelligent: Supporting purposeful questioning with AI.* Technology and Engineering Education.

Cook K., Ivy, J., **Maiorca, C.,** Tripp, O., Burton, M., Jackson, C., Bush, S., Mohr-Schroeder, M., Edelen, D., Schroeder, C., Roberts, T. (2024). STEM Rocks Research Collective: Building and Sustaining a Collaborative, Equity-Focused Scholarly Community. *Educational Sciences.*

Maiorca, C., Martin, J., Roberts, T., Burton, M., Tripp, O. (2023). Model-Eliciting Activities: Pre-service teachers' perceptions of integrated STEM. *Educational Sciences*. https://doi.org/10.3390/educsci13121247

Ivy, J., Mohr-Schroeder, M., Roberts, T., Bush, S.B., Jackson, C., Burton, M., Daniel Edelen D., & **Maiorca, C.** (2023). *Discursive Practices and the Digital Divide, Kappa Delta Pi* Record DOI: 10.1080/00228958.2022.2135651

Bush, S. B., *Edelen, D., Roberts, T., **Maiorca, C.,** Ivy, J. T., Cook, K. L., Tripp, L. O. Burton, M., Alameh, S., Jackson, C., Mohr-Schroeder, M. J., Schroeder, D. C., *McCurdy, R. P., Cox Jr., R. (2022). Humanistic STE(A)M instruction through empathy: Leveraging design thinking to improve society. *Pedagogies: An International Journal.* DOI: 10.1080/1554480X.2022.2147937

Maiorca, C., & Benken, B. (2022). Engaging prospective elementary teachers in integrated STEM contexts to learn mathematics content and pedagogy. *Connections Thematic Articles: Integration in Mathematics Teacher Education.* https://amte.net/connections/2022/05/connections-thematic-articles-integration-mathematics-teacher-education

Roberts, T., **Maiorca, C.**, Jackson, C. & Mohr-Schroeder, M. (2022). Integrated STEM as problem-solving practices. *Investigations in Mathematics Learning*, (14)1, p. 1-13. DOI: 10.1080/19477503.2021.2024721

Burton, M., **Maiorca, C.**, & Tripp, L. O. (2022). The Relationship between Teacher Candidates' Affective Dispositions and Instructional Planning Actions in STEM. *Education Sciences*, *12*(2), 82.

Cook, K., Alameh, S., Tripp, O. **Maiorca, C.**, Schroeder, C., & Mohr-Schroder, M. (2021). Five Practices for Effective and Equitable Discourse: An Example from a Virtual STEM Experience. *Connected Science*.

Jackson, C., Mohr-Schroeder, M. J., Bush, S., **Maiorca, C.**, Roberts, O. T., (2021). Toward an equity-based STEM literacy conceptual framework.

Maiorca, C. (2021). GPS: Using Engineering Design Problems to Promote Mathematical Problem Solving. *Mathematics Teacher: Learning and Teaching PK-12*, 114 (2), p. 154 -158)

Maiorca, C., & Mohr-Schroeder, M. (2020). Elementary preservice teachers' integration of engineering into STEM lesson plans. *School Science and Mathematics*. DOI: 10.1111/ssm.12433

Maiorca, C., Roberts, T., Jackson, C. Bush, S. Delaney, A. Mohr-Schroeder, M. Yao, S. (2021). Informal Learning Environments and Impact on Interest in STEM Careers. *International Journal of Science and Mathematics Education*. DOI: 10.1007/s10763-019-10038-9

Mohr-Schroeder, M., Bush, S., **Maiorca, C.**, Nickels, M. (2020). STEM literacy. *Handbook of Research on STEM Education*. C. Johnson, M. Mohr-Schroeder, T. Moore & L. English (Eds). New York, NY: Routledge/Taylor & Francis. (Editor reviewed)

Maiorca, C., & Stohlmann, M., & Driessen, E. (2019). Getting to the bottom of the truth: STEM shortage OR STEM surplus? Sahin, A., & Mohr-Schroeder, M. J. (Eds). *Myths and Truths: What has years of K-12 STEM education research taught us?* Brill Publishing.

Roberts, T., **Maiorca, C.**, & Chapman, P. (2019). Equitably engaging all students in STEM. *The Elementary STEM Journal* (23)4, 30–33.

Shih, J., Ing, M., Phelan, J., Brown, R. & **Maiorca, C.** (2019). *The Influence of Students' Self-Perceptions and Mathematics Experiences on Learning More Mathematics in the Future*. Investigations in Mathematics Learning. DOI: 10.1080/19477503.2019.1582960

Roberts, T., Jackson, C., Mohr-Schroeder, M., Bush, S., **Maiorca, C.**, Cavalcanti, M., Schroeder, C., Delaney, A., Putnam, L., & Cremeans, C. (2018). Students' perceptions of STEM learning after participating in a summer informal learning experience. *International Journal of STEM Education*. DOI: 10.1186/s40594-018-0133-4

Stohlmann, M., **Maiorca, C**., & DeVaul, L. (2017). Elementary teachers' engineering design activities from a state without engineering standards. *Science Educator, 26*(1), 1-12.

Stohlmann, M., **Maiorca, C**., & Allen, C. (2017). A case study of teachers' development of well-structured mathematical modeling activities. *Mathematics Teacher Education and Development. 19*(2), 4-24

Stohlmann, M., **Maiorca, C.**, & Olson, T. (2015). Preservice secondary teachers' conceptions from a mathematical modeling activity and connections to the Common Core State Standards. *The Mathematics Educator Journal.* 24. 21-43

Stohlmann, M., Cramer, K., Moore, T., & **Maiorca, C.** (2014). Changing preservice elementary teachers' beliefs about mathematical knowledge. *Mathematics Teacher Education and Development*, *16*(2), 4-24.

Books

Jackson, C., Roberts, T., **Maiorca, C.**, Cook, K., Bush, S., Mohr-Schroeder, M. (2024). Simplifying STEM (PreK-5): Four Equitable Practices to Inspire Meaningful Learning.

Jackson, C., Cook, K., Mohr-Schroeder, M., **Maiorca, C**., & Roberts, T. (2024). Simplifying STEM (PreK-5): Four Equitable Practices to Inspire Meaningful Learning.

Book Chapters

Mohr-Schroeder, M., Bush, S., **Maiorca, C.**, Nickels, M. (2020). STEM literacy. *Handbook of Research on STEM Education*. C. Johnson, M. Mohr-Schroeder, T. Moore & L. English (Eds). New York, NY: Routledge/Taylor & Francis.

Maiorca, C., & Stohlmann, M., & Driessen, E. (2019). Getting to the bottom of the truth: STEM shortage OR STEM surplus?. Sahin, A., & Mohr-Schroeder, M. J. (Eds). *Myths and Truths: What has years of K-12 STEM education research taught us?* Brill Publishing. https://doi.org/10.1163/9789004405400_002

Maiorca, C., & Stohlmann, M. (2016). Inspiring students in STEM education through modeling activities. *Annual Perspectives in Mathematics Education 2016: Mathematical Modeling and Modeling Mathematics*. Reston, VA. (Editor Reviewed)

Conference Proceedings and Papers

Ivy, J. T., M**aiorca, C.,** Burton, M., Roberts, T., & Ivy, J. K. (2024). Lesson planning and assessment: Exploring the integration of AI tools in mathematics teacher preparation, *Proceedings of Mathematics Education in the Digital Age Conference* (pp. 207-214). Bari, Italy: European Society for Research in Mathematics Education (ERME)

Maiorca, C., Burton, M., Ivy, J. & Roberts, T. (2024). Developing Mathematics Lessons and Assessments with Chatbots for Learning in Teacher Education: Innovation and Challenges. In J. Cohen & G. Solano (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 1783-1791). Las Vegas, Nevada, United States: Association for the

Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/224210/.

Maiorca, C., Burton, M., & Tripp, O. (2021). Preservice teachers' perceptions of integrated STEM through learning experiences. In J. Herron (Ed.). *Proceedings of the 120th annual convention of the School Science and Mathematics Association (Vol. 8)*. https://www.ssma.org/assets/Proceedings/2021%20-%20SSMA%20Final%20Version%20Proceedings.pdf

Burton, M., Tripp, L. O., **Maiorca, C.**, Roberts, T., & Ivy, J. (2021). Lessons learned from teaching STEM in a virtual environment: A self-study. In J. Novotna & H. Moraova (Eds.), *Proceedings of the International Symposium of Elementary Mathematics Teaching: Broadening Experiences in Elementary School Mathematics*. Prague, the Czech Republic. Hybrid

Benken, B. & **Maiorca, C.** (2021). Using Integrated STEM as a context for to teach mathematics and expand prospective teachers' dispositions. *Fall Conference on California Council on Teacher Education*. San Diego, CA.

Maiorca, C., & Roberts, T. (2020). Examining preservice teachers' STEM dispositions through informal STEM learning. In Cribbs, J. and Marchionda, H. (Eds.). *Conference Proceedings Annual Meeting of the Research Council on Mathematics Learning*: Las Vegas, NV. https://www.rcml-math.org/assets/Proceedings/RCML%202020%20Proceedings%202-19-20.pdf

Roberts, T., & **Maiorca, C.** (2020). Exploring positive shifts in preservice elementary teachers' conceptions of mathematics. In Cribbs, J. and Marchionda, H. (Eds.). *Conference Proceedings Annual Meeting of the Research Council on Mathematics Learning: Las Vegas, NV. https://www.rcml-math.org/assets/Proceedings/RCML%202020%20Proceedings%202-19-20.pdf*

Roberts, T., Jackson, C., Mohr-Schroeder, M., Bush, S., **Maiorca, C.**, & Delaney, A. (2019). Exploring applications of school mathematics: Students' perceptions of informal learning experiences. *North American Chapter of the International Group for the Psychology of Mathematics Education*. St. Louis, MO.

Maiorca, C., & Roberts, T. (2018). Informal STEM learning changing preservice teachers' beliefs. In J. N. Thomas & M. J. Mohr-Schroeder (Eds.), *Proceedings of the 117th annual convention of the School Science and Mathematics Association* (Vol. 4). https://www.ssma.org/assets/Proceedings/2018ProceedingsFinalWeb.pdf

Maiorca, C., & Stohlmann, M. (2017). The impact of an integrated STEM after-school program on elementary students' beliefs about the role of the teacher. *Proceedings of the 16th annual Hawaii International Conference on Education.*

Non-Peer-Reviewed Publications

Maiorca, C. & Roberts, T. (2024). Déjà vu: The dawning of a new artificial educational era?. *Technology Engineering Education*.

Roberts, T., Jackson, C., Mohr-Schroeder, M.J, **Maiorca, C.,** Bush, S., & Cook, K. (2024). Disrupting the STEM status quo with equity-focused integrated STEM practices (ISPs). *School Science and Mathematics. https://doi.org/10.1111/ssm.12665*

Redmond-Sanogo, A., **Maiorca, C.**, Roberts, T., Burton, M. & Ivy, J. (2024). Navigating the Artificial Intelligence landscape: Implications for mathematics, science and STEM teaching and learning. *School Science and Mathematics.* https://doi.org/10.1111/ssm.12635

EXTERNAL FUNDING

Funded:

National Science Foundation: BCSER: An Individual Investigator Development Plan to Improve Undergraduate Debugging Skills and Mindset. **Role: Researcher and Evaluator**. Principal Investigator: John Hu. Total Award Amount: $350,000. January 2024 - December 2026. (Funded)

Department of Education: **STEAM Ecosystem Expanded Demonstration Project. Role Former PI** for California State University, Long Beach (Amount requested $167,378, Full Project Amount for the first year $1,580,125, anticipated funding for five years) (Funded)

Fluor Foundation Grant, Fluor Corporation. **CSULB STEM Ed Project**. **Role: PI** Awarded, 2020, $10,000

Fluor Foundation Grant, Fluor Corporation. **CSULB STEM Ed Project**. **Role: PI** Awarded, 2019, $10,000

Fluor Foundation Grant, Fluor Corporation. **CSULB STEM Ed Project**. **Role: PI** Awarded, 2018, $10,000

Fluor Foundation Grant, Fluor Corporation. **STEM @ The Beach. Role: PI** Awarded, Summer 2017, $3,000

Informal Learning Experiences

Maiorca, C. (2024) Pete's STEM Posse. Stillwater, OK

Maiorca, C. (Summers 2017 - 2021). STEM @ The Beach. Long Beach, CA

Maiorca, C. (2015) After School STEM Academy. Sister Robert Joseph Bailey Elementary School. Las Vegas, NV

Stohlmann, M. & Maiorca, C. (2013 & 2014). Saturday STEM. University of Nevada, Las Vegas.

Olson, T & Maiorca, C. (2013). Rebel STEM Academy. University of Nevada, Las Vegas.