Michael Foster

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EDUCATION

San Diego State University/University of California, San Diego — August 2023
Doctor of Philosophy in Mathematics and Science Education
Chair: Dr. Joanne Lobato
Committee: Dr. Chris Rasmussen, Dr. David Quarfoot, Dr. Mary Pilgrim, Dr. Christopher Halter
Dissertation: "Vicarious Learning: Scripted vs Unscripted Voices"

DePaul University, Chicago, IL — June 2016
Master of Science:
Pure Mathematics, with Distinction

DePaul University, Chicago, IL — June 2015
Bachelor of Science:
Pure Mathematics (Major), Computational Physics (Minor).
Cum Laude

TEACHING

Lecturer, Rochester Institute of Technology Rochester, NY — 2024
- Subject: Probability and Statistics I

Lecturer, DePaul University Chicago, IL — 2016 – 2018
- Subjects: Calculus I, College Algebra, College Pre-Calculus, and Quantitative Reasoning

Lecturer, MacCormac College Chicago, IL — 2018
- Subjects: Number Sense and Computer Literacy

Math Instructor, Math Circles Chicago, IL — 2016 – 2018
- Designed and implemented weekly lessons on topics ranging from number theory to graph theory for 7^{th} and 8^{th} grade students

Graduate/Teaching Assistant, DePaul University Chicago, IL — 2015 – 2016
- Subjects: Group Theory, Abstract Algebra, Real Analysis, Mathematical Reasoning, Linear Algebra, Multivariable Calculus I and II, Calculus I, II, and III
- Facilitated and structured weekly discussion sessions
- Graded and held weekly office hours

AWARDS/HONORS

Completion of Research and Creative Activity (CORE) Fellowship – College of Graduate Studies, SDSU — 2022
$2,934.12 to support research activities

Judy and Larry Sowder Research Award — 2021
$1000 to support research activities

Dean's Award for Research and Scholarship – College of Education, SDSU — 2020
$300 awarded for presentation at SDSU Student Research Symposium

RESEARCH

Postdoctoral Researcher August 2023-Present

Supported by the National Science Foundation through Award DGE-2222337, The Science and Mathematics Education Research Collaborative Postdoctoral Program, Dina Newman (PI, RIT), Tony Wong (Co-PI, RIT), Ben Zwickl (Co-PI, RIT), Scott Franklin (Co-PI, RIT), and Leslie Wright (Co-PI, RIT).

- Planned and implemented data collection comparing undergraduate students' uses of different computational tools in their Probability and Statistics I course
- Designed and administered undergraduate student and instructor surveys
- Analyzed data using qualitative methods, including the use of novel techniques in deductive coding using large language models (Jina AI)
- Supervised undergraduate research experiences in mathematics education and mentored their progression toward the presentation and authorship of research findings

Graduate Research Assistant September 2019-August 2023

Supported by the National Science Foundation through Award DRL-1907762, Developing and Investigating Unscripted Dialogic Mathematics Videos, Joanne Lobato (PI, SDSU) and John Gruver (Co-PI, Michigan Technical University).

- Conducted textbook analyses
- Helped construct hypothetical learning trajectories for high school level mathematics
- Assisted in the filming and post-production of dialogic instructional videos
- Developed a virtual filming protocol
- Planned and implemented data collection for student's use of project videos
- Analyzed data of students learning from project videos

Graduate Research Assistant September 2018-August 2019

Supported by the James S. McDonnell Foundation grant, ClassInSight: Insight on Teacher Learning by Scaffolding Noticing and Reflection, Amy Ogan (PI, Carnegie Mellon) and Sherice Clarke (Co-PI, UCSD)

- Collected observational data from local middle and high school science classrooms
- Conducted interviews with local science teachers.

Graduate Research Apprenticeship Winter 2018

Project: *Classifying Mathematical Problem Types*
Supervisor: Dr. David Quarfoot, UC San Diego

- Analyzed textbooks connecting skill expectations in the example problems to the skill expectations of homework problems
- Coded problems for isomorphic features or skills

Graduate Research Apprenticeship Spring 2018

Project: *Re-imagining Video-Based Online Learning*, NSF Award DRL-1416789
Supervisor: Dr. Joanne Lobato

- Analyzed data using the method of open coding

PUBLICATIONS

Foster, M., White, I., & Lobato, J. (in review). How do students make sense of dialogic mathematics videos?. *Journal of Computers in Mathematics and Science Teaching.*

Foster, M. (2024, July). Vicarious learning scripted versus unscripted videos: problem-solving behaviors. Proceedings at the *47th Conference the International Group for the Psychology of Mathematics Education (Vol 2., pp. 200-207), Auckland, New Zealand*.

Foster, M., Cammarota, C., Dunham, M., Zwickl, B., & Wong, T. (in review). A framework for assessing students' computational literacy: case studies in undergraduate mathematics. *The International Journal of Research in Undergraduate Mathematics Education.*

Foster, M., Dunham, M., Cammarota, C., Verostek, M., Zwickl, B., & Wong, T. (Eds.) (2024). Toward an assessment of students' (social) computational literacy. General Proceedings of the *4th Annual Meeting of the International Society of the Learning Sciences 2024. Buffalo, New York: International Society of the Learning Sciences*.

Lobato, J., Gruver, J., & **Foster, M.** (2023). Students' development of mathematical meanings while participating vicariously in conversations between other students in instructional videos. *The Journal of Mathematical Behavior*, *71*, 101068.

White, I., **Foster, M.**, & Lobato (2023). Making sense of algebraic expressions in context. *Mathematics Teacher: Learning & Teaching PK-12. 116*(8), 604-612.

Foster, M. (2022, November). A Bakhtinian lens on the use of dialogic instructional videos. Proceedings at the *44th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (pp. 1970-1976), Nashville, TN*.

Gruver, J., Lobato, J., & **Foster, M.** (2022, July). Investigating the learning process of students using dialogic instructional videos. Proceedings at the *45th Conference the International Group for the Psychology of Mathematics Education (Vol 2., pp. 323-330). Alicante, Spain*.

Clarke, S.N., Gates, Z., **Foster, M.**, Shintre, S. (2020) Mapping the design space for teacher learning through reflection. In M. Gresalfi, & I. S. Horn(Eds.). *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1. Nashville, Tennessee: International Society of the Learning Science*s. (pp. 2293-2296)

PRESENTATIONS

*Mitelman, A., **Foster, M.**, Bogstad, B., Cammarota, C., Zwickl, B., & Wong, T. (2024, August). Computation in statistics: students' perceptions of faculty objectives. Presentation at the *33rd Annual Undergraduate Research Symposium Rochester Institute of Technology, Rochester, NY*.

*Bogstad, B., Cammarota, C., Mitelman, A., **Foster, M.**, Wong, T., & Zwickl, B. (2024, August). Building computational modeling skills with a genetics activity. Presentation at the *33rd Annual Undergraduate Research Symposium Rochester Institute of Technology, Rochester, NY*.

Foster, M. (2024, July). Vicarious learning scripted versus unscripted videos: problem-solving behaviors. Presentation at the *47th Conference the International Group for the Psychology of Mathematics Education, Auckland, New Zealand.*

Foster, M., Dunham, M., Cammarota, C., Verostek, M., Zwickl, B., & Wong, T. (Eds.) (2024, June). Toward an assessment of students' (social) computational literacy. Presentation at the *4th Annual Meeting of the International Society of the Learning Sciences 2024, Buffalo, NY: International Society of the Learning Sciences*.

Foster, M., Cammarota, C., Zwickl, B., & Wong, T. (2024, May). Computational literacy in biology. Presentation at the *Society for Advancement of Biology Education Research East, Rochester, NY.*

Gruver, J., Lobato, J., & **Foster, M.** (2022, July). Investigating the learning process of students using dialogic instructional videos. Presentation at the *45th Conference the International Group for the Psychology of Mathematics Education, Alicante, Spain*.

Gruver, J., **Foster, M.**, & Lobato, J. (2022, September). Envisioning the use of instructional videos to support mathematics discourse. Interactive Session at the *2022 NCTM Research Conference, Los Angeles, CA*.

Foster, M. & White, I. (2022). A Different Kind of Instructional Math Video: Project Math Talk. Conference workshop at *Orange County Mathematics Council Conference, 2022, virtual*.

Foster, M., White, I., & Lobato, J. (2022, August). Student thinking unmuted: Creation of unscripted dialogic videos. Presentation at the *Greater San Diego Math Council Annual Conference, San Diego, CA*.

Foster, M., Lobato, J., & Gruver, J. (2022, April). A Bakhtinian perspective on learning with dialogic mathematics videos. Presentation at the *Annual Conference of the American Educational Research Association, San Diego, CA*.

Gruver, J., **Foster, M.**, & *Keysor, E. (2021, October). Making sense of non-integer exponents using a number line model. Presentation at the *43rd Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education, Philadelphia, PA.*

Lobato, J., **Foster, M.**, & Haro, J. (2020, February). Learning from online math videos that feature student dialogue. Presentation at the *Greater San Diego Math Council's 37th Annual Conference, San Diego, CA*.

Lobato, J., & **Foster, M.** (2021, February). Project MathTalk: Creating and researching online math videos that feature student dialogue. Presentation at *MSED Candidate Day, San Diego State University, San Diego, CA*.

Lobato, J., **Foster, M.**, & Haro, J. (2020, February). Re-imagining video-based online learning. Presentation at *MSED Candidate Day, San Diego State University, San Diego, CA*.

POSTERS

Lobato, J., Gruver, J., **Foster, M.**, White, I., & Gonzales, A. C. (2023) Student Voices Unmuted: Research using Videos that Feature Student Dialogue. Poster presentation at *National Council of Teachers of Mathematics Research Conference 2023, Washington, D.C.*

SERVICE

- Refereed three proposals for the Annual Conference of the American Educational Research Association, San Diego, CA (AERA)
- Refereed two proposals for the 44th Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (PMENA-44)
- Refereed three proposals for the 43rd Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education (PMENA-43)

MEDIA

www.mathtalk.org

- Assisted in video creation. This included: writing and designing lessons for filming, assisting in the filming, leading the editing process for individual units (i.e., determining what segments to include), and scripting and recording voice-overs.
- Helped in designing the website as well as a distance filming protocol for filming during the COVID-19 pandemic

Dissertation

- Designed, filmed, edited, produced using Final Cut Pro, and recorded voice-overs for a series of unscripted dialogic instructional videos (an example video can be found here).
- Scripted, filmed, edited, produced using Final Cut Pro, and recorded voice-overs for a series of unscripted dialogic instructional videos (an example video can be found here).