

Johan Benedict A. Cristobal

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RESEARCH INTEREST

I study frames of teaching and of learning. Specifically, how it changes or is shaped by the experiences and culture around the individual. By utilizing critical theories, I aim to tackle the problem of cultures of mathematical exclusion, particularly as they appear in post-secondary contexts.

EDUCATION

University of Nebraska - Lincoln (UNL)

▷ Ph.D. in Mathematics expected May 2025

Dissertation (Working) Title: *Culture and Context: How Frames of Teaching and Learning Mathematics Form and Change for Graduate Student Instructors*

Advisor: Dr. Yvonne Lai | *Minor in Teaching, Learning, and Teacher Education*

▷ M.S. in Mathematics December 2021

University of California, Los Angeles

▷ B.S. in Mathematics of Computation June 2020

POSITIONS

Graduate Research Assistant *Various Projects*

- ▶ Educating Undergraduate Students for STEM Career Opportunities in Nebraska: Networks, Experiential-learning, & Computational Thinking (STEM CONNECT)

NSF/S-STEM DUE-1930211; PI Jim Lewis

Spring 2024 to **Present** – I co-analyzed/conducted interviews of (previous) STEM CONNECT students to collect and report on narratives about perseverance within a STEM degree and undergraduate education, with careful consideration of how to help students finish their STEM degrees. These students are primarily of minority and/or first-generation identity.

- ▶ College of Arts & Sciences Strategies Priorities: *Understanding the experiences of underrepresented students in 300-level mathematics courses*; PI Amy Bennett

Fall 2023 to **Present** – I co-analyzed underrepresented undergraduate student narratives about their experiences leading up to and taking a real analysis course for the purpose of creating and running a follow-up study with post-secondary mathematics professors and how they notice and frame these narratives with respect to their practice.

- ▶ Mathematics of Doing, Understanding, Learning and Educating for Secondary Schools (MODULE(S²)) – NSF DUE-1726744; PI Yvonne Lai

Summer 2022 to Spring 2024 – I co-analyzed teachers' open-ended responses to survey data to identify qualitative signals of increased expectancy to succeed in teaching, doing, or learning mathematics, or value for inclusive teaching practices.

- Investigating the Role of Collaboration on the Development of Student Ideas using a Learning Progression for the Function Concept – NSF DRL-2101393; PI Edith Graf
Spring 2023 to Spring 2024 – I helped map the learning progressions to a Bottle filling activity made as a reality-based activity to learn the concept of functions. I participated and co-led the professional development meetings to learn about (virtual) talk moves.
- CSForAll: **A**dapt, **I**mplement and **R**esearch at Nebraska (AIR@NE)
NSF DRL-1837476; PI Leen-Kiat Soh
Summer 2021 – I conducted interviews of the CSForAll: AIR@NE summer cohort. I checked the accuracy of summaries of previous interview transcriptions.

Research Experience for Undergraduates (REU) Mentor

Summer 2024 | Mathematics Department at UNL

- ▷ First Generation First Year Research Experience for Undergraduates
NSF/DMS-2236983; PI Eloísa Grifo
Affectionally named SMORES (**S**ummer **M**athematics **O**rientation & **R**esearch **E**xperience**S**). Working with another graduate student, I co-organized and co-led this REU for a group of four first-generation students from an Upward Bound program who begin college in the Fall term. Along with completing an appropriately designed applied mathematics research project, we also provided orientation-like experiences to students (touring campus and resources, hosting panels, etc.). Link to recording of the students' presentation: (pending on upload)

Graduate Teaching Assistant *Various Sub-Roles*

August 2020 to **Present** | Mathematics Department at UNL

- As a *Recitation Leader*, I ran recitations once or twice a week to review the lectures, hold guided problem-solving sessions, and address student's homework concerns.
- As an *Instructor of Record*, I taught a section of students, using active-learning and writing assessments for students.
- ◆ As a *Course Developer*, I reordered the sections of the textbook to better scaffold topics and made the corresponding updates for the course materials (LaTeX and HTML/PreTeX) and online homework. I created Notes pages for students and instructors to use. I made videos for the Intermediate Algebra course and are embedded in the open-source textbook. I also co-developed the first pedagogy seminar for mathematics learning assistants, embedding equity-oriented teaching practices into their learning.

TEACHING

Walter Mientka Teaching Award | Awarded 2021 by the UNL Math Department.

"The Walter Mientka Award is given to students who demonstrate exceptional promise as a teacher based on their work during their first one or two years as a graduate teaching assistant in our department."

Courses Taught as Instructor of Record / ◆ denotes courses I also worked on as Course Developer.

- ◆ Math 103 - College Algebra and Trigonometry Fall 2024
- ◆ Math 97 - Assisting Learning for University Mathematics Fall 2024

- Math 302 - Math Modeling Spring 2023
- ♦ Math 101C - College Algebra Corequisite Fall 2022
- ♦ Math 101 - College Algebra Spring 2022
- ♦ Math 100A - Intermediate Algebra Fall 2021

Courses Taught as Recitation Leader.

- Math 221 - Differential Equations Fall 2023
- Math 107 - Calculus II Spring 2021
- Math 106 - Calculus I Fall 2020

PAPERS

Peer-reviewed Conference Proceedings

- [1] **Cristobal, J. B.** (2024). Complicating the Relationship of Frames and Responses in Teacher Noticing. In Cook S., Katz B., Moore-Russo, D. (Eds.), *Proceedings of the 26th Annual Conference on Research in Undergraduate Mathematics Education*, Omaha, Nebraska (pp. 268-276). [Contributed Report]
- [2] Funk, R., Pai, L., & **Cristobal, J. B.** (2024). "Persistence in a S-STEM grant: Understanding the Intersectional Experiences of Women Pursuing STEM." Conference Paper for the *2024 American Society for Engineering Education Annual Conference & Exposition*.
- [3] Funk, R., Pai, L., Rader, B., **Cristobal, J. B.**, & Lewis, J. (2024). "'Someone has invested in me to do this': Supporting Low-Income Students to Persist in STEM through a NSF S-STEM grant." Poster Paper for the *2024 American Society for Engineering Education Annual Conference & Exposition*.
- [4] **Cristobal, J. B.** (submitted). From "Struggle" to "Acceptance": Andy's Narrative of First-Time Teaching and Her Frames.
- [5] **Cristobal, J. B.** (submitted). Aspects of Culture and Context which Shape Frames of Teaching and Learning.

In-progress for Journal Publications

- [1] Funk, R., Pai, L., **Cristobal, J. B.**, & Xie, N. (in-progress). "Just because I am the diversity quota": Understanding the Influence of Power on the Experiences and Identities of S-STEM Women Scholars.
- [2] **Cristobal, J. B.** (in progress). Looking Inside the Black Box: Frames in the Context of Teaching Mathematics.

FUNDING/GRANTS

- [1] **Title:** Conference: Accelerating Research in Graduate Mathematics Education (ARGME)
Role: Organizing Committee Member
Project Budget: \$50,000
Funded by: NSF Directorate for STEM Education
Solicitation: EDU Core Research (ECR:Core) Status: Submitted October 3, 2024
Description: A virtual conference consisting of a day-long event that initiates a year-long monthly series of seminars where research in graduate mathematics education is shared and discussed. The intent is to start a formal space for these works to be shared, and also to inspire future work and cross-institution collaborations.

TALKS (Reverse chronological)

- [1] *Success, Struggle, Surprise, and Short-term Goals: Reflections from Mathematics Graduate Students Teaching* (Accepted)
Joint Mathematics Meeting 2025 in the AMS Special Session: Research Presentations by Math Alliance Scholar Doctorates.
- [2] *Successes, Struggles, Surprises and Short-term Goals of Mathematics Graduate Student Instructors Teaching for the First Time*
Mathematical Association of America's MathFest 2024 in the Research in Undergraduate Mathematics Education session. <https://youtu.be/1TYHb2xk5Hg>
- [3] *Understanding the Intersectional Experiences and Identities of Women Who Persist in STEM*
2024 Nebraska Mathematical Association of Two Year Colleges, with Dr. Rachel Funk.
- [4] *Coloring the Relationship of Frames and Responses in Teacher Noticing*
26th Annual Conference on Research in Undergraduate Mathematics Education (Special Interest Group of the Mathematical Association of America on Research in Undergraduate Mathematics Education, SIGMAA on RUME). <https://youtu.be/HE6XIPJRokY>
- [5] *Before and during teaching: New graduate student instructors' frames of teaching*
7th Northeastern Conference on Research in Undergraduate Mathematics Education.
- [6] *Bridging Frames and Sociomathematical Norms*
6th Northeastern Conference on Research in Undergraduate Mathematics Education.

SERVICE

Graduate Student Teaching Table	Fall 2022 - Present
<i>Co-founder and organizer</i>	
Seminar designed for and by graduate students to discuss education or teaching issues we face at UNL as GSIs, using education literature to organize conversations.	
Research in Graduate Mathematics Education (RGME)	Summer 2024 - Present
<i>Website Manager, Member on the Organizing Committee</i>	https://www.johanmath.com/RGME
<i>Writer for the Working Group Proposal</i>	
UNL Math Department Recruitment	Graduate Student Volunteer
<i>Math Alliance Field of Dreams Conference</i>	November 2022
<i>Joint Mathematics Meeting</i>	January 2024
<i>2024 AMS Online Fall Graduate School Fair</i>	October 2024
UNL Math Department Orientations	Summer 2024
<i>Speaker in the First Year and the Returning Graduate Student Orientation,</i>	
<i>Organizer of the Mathematics Learning Assistant Orientation</i>	
UNL Math Day Organizing Committee	Fall 2023 - Spring 2024
<i>Graduate Student organizer for Volunteer outreach/management</i>	
Outreach event for Nebraskan high school students that encourage them to pursue a career in a mathematics-based trajectory: math.unl.edu/math-day-university-nebraska-lincoln	
Session Moderator and Volunteer for RUME 26	February 2024
<i>26th Annual Conference on Research in Undergraduate Mathematics Education</i> at Omaha, NE	
Guest Peer-Reviewer for PRIMUS	Fall 2023
<i>Problems, Resources, and Issues in Mathematics Undergraduate Studies – Volunteer</i>	
Qualifying Exam Review and Preparation Session	Summer 2022
<i>Math 830/831 - Ordinary and Partial Differential Equations</i>	

RELEVANT GRADUATE COURSE WORK for Education Research

Supplementary courses taken that are not part of the Mathematics Ph.D. program.

■ Educational Psychology Department:

859 - Statistical Methods

Quantitative Methods

900K - Qualitative Approaches to Education Research

Qualitative Methods

■ Teaching, Learning, and Teacher Education Department:

801 - Curriculum Inquiry

807C - Equitable Practices in Mathematics Education: Mathematics Classroom Discourse

861 - Education for a Pluralistic Society: Foundation and Issues

880E - Teaching with Technology: Instructional Technology in Mathematics

949B - Critical, Anti-colonial, & Decolonizing Theories in Education

NOTABLE CONFERENCES & PROFESSIONAL MEETINGS

◇ = Spoke , ★ = Invited , † = Department Volunteer, \$ = Travel funded

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|---|---------------|
| 1. Joint Mathematics Meetings Virtual | January 2021 |
| 2. KUMUNI-ISU Conference on PDE, Dynamical Systems,
and Applications UNL, Lincoln, NE | October 2021 |
| 3. ◇ 6th Northeastern Conference
on Research in Undergraduate Mathematics Education Virtual | October 2022 |
| 4. † Field of Dreams Conference Minneapolis, MN | November 2022 |
| 5. 25th SIGMAA on RUME Omaha, NE | February 2023 |
| 6. ◇ 7th Northeastern Conference
on Research in Undergraduate Mathematics Education Virtual | November 2023 |
| 7. † Joint Mathematics Meetings San Francisco, CA | January 2024 |
| 8. ◇ 26th SIGMAA on RUME Omaha, NE | February 2024 |
| 9. \$ Workshop: Critical Issues in Mathematics Education 2024:
Bringing Innovation to Scale: Teaching-Focused Faculty as Change Agents Berkeley, CA | April 2024 |
| 10. <i>JimFest:</i> What, where, and for what purpose is the mathematics
in mathematics teacher education? Lincoln, NE | May 2024 |
| 11. ◇ \$ MAA Mathfest Indianapolis, IN | August 2024 |

SKILLS

Mathematics \LaTeX , curriculum development

Statistical Methods RStudio

Programming C, C++, Python, Matlab, LISP, SQL, and HTML/CSS (Web-design)

Languages English (fluent), Filipino/Tagalog (native fluent), Spanish (intermediate)

Video/Content Creation <https://www.youtube.com/@johango>, textbook videos, and
conference or presentation videos

Graphic Design <https://www.johanmath.com/design>