Haoyi Wang

haoyiw@seas.upenn.edu | Google Scholar | 0000-0002-1419-7110 | haoyiwww.github.io | LinkedIn

Research Interests

Mathematical cognition; Mathematical problem-solving; Values in mathematics education;

Education

Master of Computer and Information Technology (Data Science), *GPA 4.0/4.0* Present
University of Pennsylvania, School of Engineering and Applied Science

Master of Education in Human Development and Education, *GPA 4.0/4.0* 2022
Harvard University, Graduate School of Education

Bachelor of Arts in Mathematics (Major) & Music (Minor), *Cum Laude* & *Honors* 2019
Carleton College

Budapest Semesters in Mathematics Education, Budapest, Hungary (Fall 2019)

Doshisha University Exchange Program, Kyoto, Japan (Spring 2018)

Publications

Wang, H. (2024). Book Review: Applying values in mathematics education. *Educational Studies in Mathematics*. DOI:10.1007/s10649-024-10329-1

Wang, H., & Star, J. R. (2023). Investigating algorithm-oriented flexibility and structure-informed flexibility in mathematics learning. *Asian Journal for Mathematics Education*, 2(1), 16-41. DOI:10.1177/27527263231163593

Wang, H. (2021). What works and what does not: a reflective practice on an online mathematics class. *Mathematics Teaching Research Journal*, 13(1), 16-30. http://www.hostos.cuny.edu/mtrj

Matzal, C., Manahan, K., Galaty, B., **Wang, H.**, & Barbarics, M. (2020). Guided discovery in Hungarian education using problem threads: the Pósa method in secondary mathematics classrooms. *Teaching Mathematics and Computer Science Journal*, 18(1), 51-67. DOI:10.5485/ TMCS.2020.0491

Presentations

Wang, H. (2024, July 17-21). *Trends and predictors of math anxiety in Canada: The role of learning strategies* [Conference presentation poster]. The 47th Psychology of Mathematics Education Conference (PME 47), Auckland, New Zealand.

Wang, H. (2024, July 7-14). *U.S. eighth-grade students' mathematics reasoning and attitude towards mathematics: Analysis of TIMSS 2011, 2015, and 2019* [Conference presentation poster]. TSG 3.6, the 15th International Congress on Mathematical Education (ICME 15), Sydney, Australia.

Wang, H. (2024, March 23). *Exploring the rise of math anxiety among Canadian students: The role of instructional strategies* [Conference presentation poster]. The Mathematics Education Forum Research Day, the Fields Institute for Research in Mathematical Sciences, Toronto, Canada.

Wang, H. (2023, July 15-16). *Classroom interactions in Hungarian guided discovery math camps* [Conference presentation paper]. 2023 Cambridge China Education Forum, the University of Cambridge, Cambridge, UK.

Wang, H., & Chi, C. (2022, April 21-23). *Investigating the numerical cognitive development of rural Chinese preschoolers living in poverty* [Conference presentation poster]. 2022 Cognitive Development Society Biennial Conference, Madison, USA.

Uscianowski, C., & **Wang, H.** (2022, April 1-2). *Use of math storybooks and oral storytelling to improve the numeracy and storytelling skills of students with learning disabilities* [Conference presentation paper]. Learning through Play and Imagination: Expanding Perspectives, Special Topic Meeting, Society for Research in Child Development.

Wang, H. (2021, September 11-15). *Educational Game Report: Milk-Tea shops and linear programming* [Conference presentation paper]. The 25th Global Chinese Conference on Computers in Education, the Education University of Hong Kong.

Wang, H. (2021, July 12-19). *A reflective practice on an online Mathematics class* [Conference presentation paper]. TSG 49, the 14th International Congress on Mathematical Education (ICME 14), Shanghai, China.

Research Experience

Research Assistant 2021 September – Present, Part-time

The Star Lab, Harvard Graduate School of Education *Cambridge, Massachusetts*

- Co-lead a study employing the 'Compare and Discuss Multiple Strategies' approach in Chinese mathematics classrooms, supervised by Dr. Jon Star. I designed the intervention materials and the experiment. Currently, I am preparing the professional development programs and collecting data for the pilot study.
- Constructed multi-level models using exam data collected from 450 high school students, as part of a project investigating procedural flexibility in algebra and arithmetic problem-solving.

Research Assistant 2024 March – August, Part-time

The Liang Lab, Hong Kong University *Hong Kong*

- Conducted a detailed analysis of 20 clinical interview video recordings, each 1.5 hours long, focusing on students and teachers learning algebra, geometry, and probability concepts through Scratch. This project aimed to model the process of abstraction in mathematics learning at a programming-enhanced problem-solving context.
- Compiled a comprehensive Scratch task bank aimed at enhancing middle-school mathematics learning, drawing from over 100 relevant academic journal articles.

Research Assistant 2021 September – 2022 June, Part-time

Harvard Center for Education Policy Research *Cambridge, Massachusetts*

- Built 2 multi-section survey forms in Qualtrics for the Math Teacher Rehearsals project, which aimed to improve the quality of math instruction and student learning outcomes by providing teachers with feedback and coaching on their lesson plans and delivery.
- Transcribed 34 voice recordings and cleaned datasets for the Mathematical Knowledge for Teaching Measures project, which developed and validated new assessments of teachers' mathematical knowledge and pedagogical content knowledge.

Research Assistant 2021 June – 2022 March, Part-time

The Row Lab, Harvard Graduate School of Education *Cambridge, Massachusetts*

- Transcribed and coded naturalistic video data from 80 parent-child dyads using CLAN software as part of the Early Math Project, supervised by Dr. Meredith Rowe.
- Investigated the role of parent-child interaction in early mathematical development and the effects of different types of parental scaffolding on children's math skills.

Research Assistant 2021 May – 2022 August, Part-time

Child Learning Lab, University of Cincinnati *Virtual*

- Conducted systematic literature reviews on the effects of math storybook interventions on preschool children's math skills and attitudes, using databases such as ERIC, PsycINFO, and Web of Science.
- Coded video data from 44 children for the Math Story Time project, which evaluated the impact of reading math-related storybooks on children's math learning and enjoyment, supervised by Dr. Colleen Uscianowski.

Awards & Honors

Frontiers of Educational Technology Summer School (Tuition), Peking University	2023
China-Harvard Fellowship ($16,960), Harvard University	2021 – 2022
Student Conference Fund ($750), Harvard Graduate School of Education	2022
Graduate Student Scholarship ($500), LearnLab Learning Science Workshop	2021 & 2022
The Konhauser Problemfest Math Group Contest, First Place & Third Place	2018 & 2019
MAA-North Central Section Team Math Competition, Top Ten	2017 & 2018

Professional Service

Reviewer, AERA Annual Meeting (SIG-Research in Mathematics Education)	2023
Reviewer, Global Chinese Conference on Computers in Education (Workshop)	2021
Mentor, Harvard Student-Alumni Mentoring Initiative	2023 – 2024
Volunteer Academic Associate, Harvard College U.S.-China Relations Association	2020 – 2021

Skills

Languages: Java, Python, R, LaTeX, C#, HTML, Chinese, English

Technologies: MAXQDA, NVivo, RStudio, Visual Studio, Eclipse, PyCharm, JASP, SPSS, Git

Certificates: Google Advanced Data Analytics Certificate, Graduate Teacher Certificate, CITI IRB training

Teaching Experience

Volunteer Teacher 2024 Jan – Present, Part-time

Beijing a Class in Childhood Education Support Development Centre *Virtual*

- Teach the course Fun Science through weekly online live lessons, reaching 18 Grade 5 and 6 students in a rural primary school.
- Organize weekly course materials and construct homework and activities tailored to children's cognitive abilities and interests.

Section Leader 2023 April – 2024 June, Part-time

Code in Place, Stanford University *Virtual*

- Taught Python fundamentals and facilitated interactive and collaborative coding sessions over the span of five weeks to 30 students from diverse backgrounds and skill levels through weekly hour-long sessions.
- Assessed students' understanding and progress by assigning and grading weekly assignments and quizzes, and providing individualized feedback and support.

Graduate Instructor 2020 August – 2021 May, Part-time

Mathematics Department, University of Illinois *Urbana-Champaign, Illinois*

- Taught 4 online sections (around 120 students) of MATH124 Finite Mathematics, which covered topics such as logic, sets, probability, matrices, linear programming, etc.
- Designed and developed weekly exams and homework problem sets on Moodle, which assessed students' understanding and application of the course concepts and skills.
- Provided timely and constructive feedback and support to students through email, office hours, and discussion forums.

Teaching Assistant 2017 September – 2019 June, Part-time

Mathematics Department, Carleton College *Northfield, Minnesota*

- Tutored Probability one-on-one in the Math Skills Center for 10 hours weekly, which helped students improve their understanding and performance in the course.
- Graded weekly problem sets for 6 Calculus and Linear Algebra courses (around 180 students), which involved applying consistent and accurate marking criteria and providing constructive feedback.

Academic Counselor 2018 June – 2018 August, Internship

Ross Mathematics Program, Ohio State University *Columbus, Ohio*

- Graded 8 high school students' daily problem sets in number theory and abstract algebra and provided individualized feedback and support to help them develop their mathematical thinking and problem-solving skills.
- Organized bi-weekly study group events and conducted weekly office hours to foster a collaborative and supportive learning environment.

Professional Membership

International Group for the Psychology of Mathematics Education
Cognitive Development Society
American Mathematical Society