

Yilang Zhao, Ph. D.

Assistant Professor of Educational Data Science

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ACADEMIC APPOINTMENTS

- **Assistant Professor of Educational Data Science** (Aug 2025 – present), Department of Counseling, School, and Educational Psychology, The State University of New York at Buffalo (Buffalo, New York, USA)
- **Postdoctoral Research Associate** (Aug 2023 – July 2025), Center for Enhancing Education in Mathematics and Sciences, University of Tennessee, Knoxville (Knoxville, Tennessee, USA)

EDUCATION

- **Ph. D. in Curriculum and Instruction**, May 2023 – the University of Wisconsin–Madison (Madison, Wisconsin, USA)
Dissertation title: Tiles, Game, and Coordinate Plane: Exploring Learning Vector Addition Through Concreteness Fading
Advisors: Dr. Matthew Berland & Dr. Mitchell Nathan
Track: Design, Informal, and Creative Education (DICE)
Minor: Educational Psychology – Learning Sciences
- **M. A. in Media and Information**, May 2017 – Michigan State University (East Lansing, Michigan, USA)
Track: Human-computer Interaction
- **Graduate Certificate in Serious Game Design and Research**, May 2017 – Michigan State University (East Lansing, Michigan, USA)
- **B. E. in the Internet of Things**, June 2015 – Wuhan University of Technology (Wuhan, China)

JOURNAL PUBLICATIONS

- **Zhao, Y.,** & Nathan, M. J. (2025). Learning vector addition using concreteness fading: the role of gesture production. *Mind, Culture, and Activity*, 1–21.
<https://doi.org/10.1080/10749039.2025.2548876>
- **Zhao, Y.,** Bertling, J., Hodge, L., & Dyer, E. (2024). Bridging Data and Art: Investigating Data-Art Connections in a Data-Art Inquiry Program. *Journal of Science Education and Technology*. <https://doi.org/10.1007/s10956-024-10166-0>
- **Zhao, Y.** (2024). From Tiles to Worksheet: Exploring Concreteness Fading in Learning Vector Addition. *Education Sciences*, 14(7), Article 7.
<https://doi.org/10.3390/educsci14070730>
- Feng, F. & **Zhao, Y.** (minor revision). Whose Story Gets Told? Gender, Power, and Participation in Mathematics Storytelling. *Pedagogy, Culture and Society*

PUBLICATIONS IN REVIEW AND ADVANCED PREP

- **Zhao, Y.,** & Hodge, L. (in revision). Why Data Matters? Exploring Personal Data Relevance in a Data-art Inquiry Program. *Information and Learning Sciences*
- **Zhao, Y.** & Berland, M. (in revision). Exploring students' understanding of vector addition through constructionist storytelling. *Thinking Skills and Creativity*
- Zahra, F., **Zhao, Y.,** & Chidziwisano, H. (under review). How Ethically Use AI in Higher Education: A Freirean Approach. *International Journal of Artificial Intelligence in Education*
- **Zhao, Y.,** Rosenberg, J., & Hodge, L. (under review). Dynamic Topic Modeling in Non-Formal Learning: Using BERTopic to Analyze Youth Discourse in an Interdisciplinary Data Science Program. *Computers and Education*
- **Zhao, Y.,** Stevenson, D. M., & Hodge, L. (manuscript in preparation). Linking Data and Community: Fostering Civic Engagement through Artistic Data Visualization. *Social Education*
- Bertling, J. & **Zhao, Y.** (manuscript in preparation). Materiality and Material Traditions: Affordances and Invitations for Youth's Data-Based Discourse.

GRANTS

Funded

- **Zhao, Y.** (2025). Our City, Our Data: Rust Belt Youth Engaging in Data Investigation with Local Data. Graduate School of Education Research Incubator Program, University at Buffalo. \$3,000. PI.

Submitted

- Rosenberg, J., **Zhao, Y.**, Reedy, A., Zahra, F., Rocconi, L., & Bentley, A. (not funded). ETD: Advance Authentic Data Wrangling for Youth through Artificial Intelligence. National Science Foundation ITEST (Innovative Technology Experiences for Students and Teachers) program. \$500,000. Co-PI, leading the proposal writing and budget planning.

PEER-REVIEWED CONFERENCE PROCEEDINGS

- Chen, C., **Zhao, Y.**, Rosenberg, J. M., & Hodge, L. L. (2025, August). Mapping the Research Landscape of Culturally Relevant Pedagogy in Computing Education: A Topic Modeling Approach. In Proceedings of the 2025 ACM Conference on International Computing Education Research V. 2 (pp. 20-20).
- **Zhao, Y.** & Nathan, M. (2024). Understanding Gestures in a Concreteness Fading Vector Addition Learning Intervention. The North American chapter of the International Group for the Psychology of Mathematics Education (PME-NA) Annual Conference 46. Cleveland, OH.
- **Zhao, Y.** & Dyer, E. B. (2024). Data Visualization Renarrated: Probing the Role of Renarrating in Data Visualization Reimagining. In Lindgren, R., Asino, T. I., Kyza, E. A., Looi, C. K., Keifert, D. T., & Suárez, E. (Eds.), Proceedings of the 18th International Conference of the Learning Sciences - ICLS 2024 (pp. 1390-1393). International Society of the Learning Sciences.
- Feng, F. & **Zhao, Y.** (2024). How does Gender Influence Math Classes?: A case of a Storytelling Activity about Learning Vector. In Lindgren, R., Asino, T. I., Kyza, E. A., Looi, C. K., Keifert, D. T., & Suárez, E. (Eds.), Proceedings of the 18th International Conference of the Learning Sciences - ICLS 2024 (pp. 1566-1569). International Society of the Learning Sciences.
- **Zhao, Y.** & Gibson, J. (2023). Vector addition in stories: Exploring knowledge application after a concreteness fading intervention. In Blikstein, P., Van Aalst, J., Kizito, R., & Brennan, K. (Eds.), Proceedings of the 17th International Conference of the Learning Sciences - ICLS 2023 (pp. 298-304). International Society of the Learning Sciences.
- **Zhao, Y.** (2022). Exploring redditors' topics with natural language processing. En 4th International Conference on Advanced Research Methods and Analytics (CARMA 2022). Editorial Universitat Politècnica de València. 25-32.
<https://doi.org/10.4995/CARMA2022.2022.15022>
- **Zhao, Y.** (2022). Exploring redditors' communication style. En 4th International Conference on Advanced Research Methods and Analytics (CARMA 2022). Editorial

Universitat Politècnica de València. 33-39.
<https://doi.org/10.4995/CARMA2022.2022.15023>

CONFERENCE ABSTRACTS AND PRESENTATIONS

- **Zhao, Y.** & Hodge, L. (2025, April). What People Eat: Youth Telling Data Stories through Critical Data Visualization Reading. In Chao, T., Decolonizing Mathematics Education Through Storytelling: A Tool for Exploring Identity, Justice, and Community. [Structured Poster Session]. American Educational Research Association (AERA) Annual Meeting 2025. Denver, CO.
- Pignataro, E., **Zhao, Y.** (2025, February). This Matters: Youth Probing Community Issues with Artistic Data Visualization [Individual Showcase]. Data Science Education K-12: Research to Practice Conference. San Antonio, TX.
- **Zhao, Y.** (2024, November). Connecting Data Science and Arts: Exploring Data-Art Integration in a Data-Art Inquiry Program [Poster]. The North American chapter of the International Group for the Psychology of Mathematics Education (PME-NA) Annual Conference 46. Cleveland, OH.
- Hodge, L. & **Zhao, Y.** (2024, July). Creating Space for Data, Art, and Stories: Student-created Data Visualizations for Community Learning [Poster]. Psychology of Mathematics Education (PME) Annual Conference 47. Auckland, New Zealand.
- **Zhao, Y.**, Bertling, J., & Dyer, E. (2024). Exploring Youth's Data Reasoning with Data Visualization [Poster]. In Lindgren, R., Asino, T. I., Kyza, E. A., Looi, C. K., Keifert, D. T., & Suárez, E. (Eds.), Proceedings of the 18th International Conference of the Learning Sciences - ICLS 2024 (pp. 2323-2324). International Society of the Learning Sciences.
- Schafer, G., Dyer, E. B., Wright, C., Hodge, L., & **Zhao, Y.** (2024). The Role of Entry Points in Defining, Cultivating, and Sustaining Community Learning with Data Artists [Poster]. In Lindgren, R., Asino, T. I., Kyza, E. A., Looi, C. K., Keifert, D. T., & Suárez, E. (Eds.), Proceedings of the 18th International Conference of the Learning Sciences - ICLS 2024 (pp. 2439-2440). International Society of the Learning Sciences.
- **Zhao, Y.** (2024, April). Data Reasoning With Self-Authored Visualization in the MVP (Mathematizing, Visualizing, and Power) Project. In Hodge, L., Community, Design, and Data Reasoning in Youth Data Visualization Practices. [Symposium]. American Educational Research Association (AERA) Annual Meeting 2024. Philadelphia, PA.
- **Zhao, Y.** & Berland, M. (2023, June). Probing mathematical language in concreteness fading vector addition learning [Poster]. International Society of Learning Science Annual Conference 2023. Montreal, Canada. DOI: <https://doi.org/10.22318/icls2023.364156>

- **Zhao, Y.** & Nathan, M. (2023, April). Probing gesturing in a concreteness fading vector addition learning experience [Roundtable]. American Educational Research Association (AERA) Annual Meeting 2023. Chicago, IL. DOI: 10.3102/2010267
- **Zhao, Y.** & Berland, M. (2023, April). Exploring math language use in learning vector addition with concreteness fading [Poster]. American Educational Research Association (AERA) Annual Meeting 2023. Chicago, IL. DOI: 10.3102/2010266
- **Zhao, Y.** (2023, April). Exploring structured self-reflection and expertise in a playful learning experience [Roundtable]. American Educational Research Association (AERA) Annual Meeting 2023. Chicago, IL. DOI: 10.3102/2018517
- **Zhao, Y.** (2022, October). Exploring how a simulation game connects concrete and abstract learning [Paper]. Meaningful Play 2022. East Lansing, MI. URL: https://meaningfulplay.msu.edu/proceedings2022/mp2022_abstract_6580.pdf
- **Zhao, Y.** (2022, October). From tiles to sheets: Learning vector addition with ‘concreteness fading’ [Poster]. Learning Sciences Graduate Student Conference, Bloomington, IN.
- **Zhao, Y.** (2021, November). Manipulating vectors playfully with embodied cognition. Learning Sciences Graduate Student Conference 2021 (virtual), Champaign, IL.
- **Zhao, Y.** & Berland, M. (2021, April). Exploring self-reflection in a playful learning experience [Roundtable]. American Educational Research Association (AERA) Annual Meeting 2021 (virtual), Orlando, FL. DOI: 10.3102/1685852
- **Zhao, Y.** (2020). Explore self-reflection and strategic thinking in a gaming setting [Lightning Talk]. Learning Sciences Graduate Student Conference 2020 (virtual), Madison, WI.
- Feng, F. & **Zhao, Y.** (2020). A study on the teaching method of reading the whole book call to arms in 10th grade. Learning Sciences Graduate Student Conference 2020 (virtual), Madison, WI.
- Feng, F. & **Zhao, Y.** (2020). Assessing the learning of practical texts. Play Make Learn 2020, Madison, WI.
- **Zhao, Y.**, Kumar, V., & Pellicone, A. (2019, October). Epistemic networks in playful assessment [Poster]. International Conference on Quantitative Ethnography 2019, Madison, WI.
- **Zhao, Y.** (2019, September). Testing an in-game self-reflection model with ENA [Poster]. Learning Sciences Graduate Student Conference 2019, Evanston, IL.
- **Zhao, Y.** & Pellicone, A. (2019). Proposing a rubric-based in-game self-reflection model [Poster]. 2019 Inaugural Symposium on Computer Science and Learning Sciences, Evanston, IL.

- **Zhao, Y.** & Ryu, C. (2018). Toward a rubric-based assessment of global digital tools and pedagogies: taking a closer look at mandarin tone learning apps [Talk]. 2018 Global Digital Humanities Symposium, East Lansing, MI.
- Cherchiglia, L., **Zhao, Y.**, Jorae, R., Zhang, Q., & Heeter, C. (2017). Tech Trek: A serious card-game about stem careers. Irish Conference on Game Based Learning, Cork City, Ireland.
- Cherchiglia, L., **Zhao, Y.**, Jorae, R., Zhang, Q., & Heeter, C. (2016). Tech Trek. International Academic Conference on Meaningful Play, East Lansing, MI.

TEACHING EXPERIENCES

- **Instructor** (University at Buffalo, SUNY)
 - Course: CEP 508 Foundations of Educational Data Science and Analytics
 - Level: Graduate
 - Term: Fall 25
 - Notes:
 - This course is one of the two required data analytics courses of UB's Educational Data Science MS and Ph. D. program.
 - This course was remodeled by me in Summer 2025.
- **Instructor** (University at Buffalo, SUNY)
 - Course: CEP 522 Statistical Methods: Inference I
 - Level: Graduate
 - Term: Fall 25
 - Notes:
 - This course is a required course of UB's Educational Data Science MS and Ph. D. programs.
 - This course was remodeled by me in Summer 2025.
- **Instructor** (University of Tennessee, Knoxville)
 - Course: STEM 685 Foundations of Educational Data Science II
 - Level: Graduate
 - Terms: Fall 24 (online synchronous), Spring 25 (online synchronous)
 - Notes:
 - This course is a featured course of UTK's Online Graduate Certificate in Educational Data Science.
 - Besides instruction, my responsibilities also include redesigning and remodeling the content and structure of this course.
- **Co-instructor** (University of Tennessee, Knoxville)
 - Course: STEM 695 Capstone in Educational Data Science

- Level: Graduate
- Term: Spring 25 (online synchronous)
- Notes:
 - This course is the capstone course of UTK's Online Graduate Certificate in Educational Data Science.
 - My responsibilities include meeting with, supervising, and co-authoring with students.
- **Graduate Instructor** (University of Wisconsin–Madison)
 - Course: C & I 277 Video Games and Learning
 - Level: Undergraduate
 - Terms: Summer 19 (online asynchronous), Fall 19 (in-person), Spring 20 (in-person → online synchronous), Summer 20 (online asynchronous), Fall 20 (online asynchronous), Spring 21 (online synchronous), Summer 21 (online asynchronous), Fall 22 (online asynchronous), Spring 23 (online asynchronous)
 - Notes:
 - This course is a required course of UW–Madison's Game Design certificate program.
 - Leading discussion classes/threads that align with the topics covered in the lectures, hosting 1-on-1 meetings with students, and grading assignments independently.
 - The instructional mode shift in Spring 20 was due to the COVID-19 pandemic.

PROFESSIONAL EXPERIENCES

- **Postdoctoral Research Associate** (Aug 2023 – July 2025), University of Tennessee, Knoxville
 - Project: Mathematizing, Visualizing, and Power (MVP): Appalachian Youth Becoming Data Artists for Community Learning (NSF DRL # 2215004)
 - Duties:
 - Leading on-site data collection and following data processing
 - Leading data analysis and research dissemination
 - Supervising undergraduate and graduate project assistants
 - Coordinating with local community partners
 - Teaching graduate-level educational data science courses
- **Research Associate** (May 2017 – April 2018), Michigan State University
 - Projects: Picky Birds 2.0 (a Chinese language learning app), Ogura Hyakunin Isshu (a Japanese poetry learning app)

- Duty: Leading the development of Picky Birds 2.0 and Ogura Hyakunin Isshu
- **Volunteer Teaching Assistant** (April 2018), Michigan State University
 - Course: AL 444 Prototyping Experience Architecture
 - Duty: Teaching User Experience (UX) design
- **Game Programmer** (June 2016 – May 2017), Michigan State University
 - Project: Picky Birds 1.5 (a Chinese language learning app)
 - Duty: Lead the programming of Picky Birds 1.5

INVITED TALKS

- **Zhao, Y.** (2025, April). Social Network Analysis in Educational Research. ESM Seminar. University of Tennessee, Knoxville.
- **Zhao, Y.** (2024, December). Centering Learners: Fostering Inclusive and Authentic Learning with Educational Data Science. University at Buffalo.
- **Zhao, Y.** (2024, March). Find the Giant: Literature Search & Management in Social Science. TPTE STEM Seminar. University of Tennessee, Knoxville.
- **Zhao, Y.** (2023, December). Bridging Educational Data Science and Learning Sciences. TPTE. University of Tennessee, Knoxville.

SKILLS AND QUALIFICATIONS

- Programming languages
 - Python, C#, R, & C++
- Data analysis tools
 - Data processing, analysis, and visualization with Python
 - Data processing and analysis with R
 - Qualitative data analysis with Nvivo, Taguette, & Dedoose
 - Quantitative data analysis with Python, R, & SPSS
- Research methods
 - Qualitative research methods (grounded theory methods, thematic analysis, discourse analysis, ...)
 - Quantitative research methods (hypothesis testing, linear regression, ANOVA, ...)
 - Computational research methods (natural language processing, epistemic network analysis, machine learning techniques, ...)
 - Literature search and management (ResearchRabbit & Zotero)
- Design and development skills

- Game design and development with Unity
- ADDIE framework for instructional design
- Project management and leadership

SERVICES AND PROFESSIONAL AFFILIATIONS

- **Ad-hoc Journal Reviewer**
 - Journal of Science Education and Technology (02/2025)
 - Journal of Statistics and Data Science Education (08/2025)
 - Mind, Culture, and Activity (10/2025)
- **Conference Peer Reviewer**
 - American Educational Research Association Annual Meeting 2026 (Div D, SIG-RME, SIG-LS, SIG-ILER, SIG-Rural Education, SIG-IT). Los Angeles, CA. 2025.
 - ACM COMPASS 2025. Toronto, Canada.
 - International Society of Learning Science Annual Conference 2025. Helsinki, Finland.
 - American Educational Research Association Annual Meeting 2025 (SIG-LS, SIG-RME). Denver, CO. 2024.
 - ACM Interaction Design and Children (IDC' 24) Conference. Netherlands. 2024.
 - PME-NA Annual Meeting. Cleveland, OH. 2024.
 - International Society of Learning Science Annual Conference 2024 (ISLS & ICLS). Buffalo, NY. 2024.
 - American Educational Research Association Annual Meeting 2024 (SIG-LS, SIG-ILER). Philadelphia, PA. 2023.
 - ACM Interaction Design and Children (IDC' 23) Conference. Chicago, IL. 2023.
 - International Society of Learning Science Annual Conference 2023. Montreal, Canada. 2023.
 - American Educational Research Association Annual Meeting 2023 (Div C, SIG-LS, SIG-ILER). Chicago, IL. 2022.
 - Learning Sciences Graduate Student Conference 2022. Bloomington, IN. 2022.
 - International Society of Learning Science Annual Conference 2022 (Virtual). Hiroshima, Japan. 2021.
 - American Educational Research Association Annual Meeting 2022. 2021.
 - Learning Sciences Graduate Student Conference 2021, Champaign, IL. 2021.
 - American Educational Research Association Annual Meeting 2021 (virtual), Orlando, FL. 2020.

- Learning Sciences Graduate Student Conference 2020, Madison, WI. 2020.
- Learning Sciences Graduate Student Conference 2019, Evanston, IL. 2019.
- **Conference Committee**
 - Submission Committee Member. Learning Sciences Graduate Student Conference 2022. Bloomington, IN. 2022.
 - Program Committee. Meaningful Play 2022. East Lansing, MI. 2022.
 - Submission Committee Member. Learning Sciences Graduate Student Conference 2020 (virtual), Madison, WI. 2020.
- **Professional Organization Affiliation**
 - American Educational Research Association (AERA)
 - International Society of the Learning Sciences (ISLS)
 - Association for Computing Machinery (ACM)

ADVISING, MENTORING, AND SUPERVISION

- **At UB**
 - **Doctoral Advisee:**
 - Naiyyir Hossain
 - **Doctoral Committee:**
 - Preston Martin
 - **Master's Advisees:**
 - Feeney, Kathleen
 - Redlecki, Faith
- **At UTK**
 - **Project Assistants**
 - Carlos Gonzalez
 - Emily Nakian
 - Kyra Bowers
 - Courtney Drennen
 - Ashley Waycaster

SCHOLARSHIP, FELLOWSHIP, AND AWARDS

- **University of Tennessee, Knoxville**
 - University of Tennessee Open Publishing Support Fund. (July 2024). \$1,800
- **University of Wisconsin–Madison**
 - UW-Madison the Graduate School Student Research Grants Competition. (May 2022). \$1,500

- UW-Madison Department of Curriculum and Instruction Travel Grant. (April 2022). \$500
- UW-Madison Department of Curriculum and Instruction Travel Grant. (Nov 2022). \$500
- UW-Madison Department of Curriculum and Instruction Research Grant. (Mar 2022). \$500
- UW-Madison Department of Curriculum and Instruction Teaching Assistantship (June 2019 – Summer 2021, Fall 2022- Spring 2023), tuition remission plus \$20,500 stipend per academic year
- UW-Madison Graduate School Fellowship (Aug 2018 – May 2019 & Aug 2021 – May 2022), tuition remission plus \$20,864 stipend per academic year
- **Michigan State University**
 - MA Merit Award, the Department of Media and Information, Michigan State University.
- **Unity Technologies**
 - Unity Certified Developer (Certificate No. 201703UCD1654, March 2017 – March 2019).