Yilang Zhao, Ph. D.

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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**. (2024). From Tiles to Worksheet: Exploring Concreteness Fading in Learning Vector Addition. *Education Sciences*, 14(7), Article 7. https://doi.org/10.3390/educsci14070730
- **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.** & Berland, M. (accepted, submitted with revision). Exploring students' understanding of vector addition through constructionist storytelling. *Instructional Science*.

PUBLICATIONS IN REVIEW AND ADVANCED PREP

- **Zhao, Y.** & Nathan, M. (under review). Learning Vector Addition Using Concreteness Fading: The Role of Gesture Production. *Mind, Culture, and Activity.*
- Zahra, F., **Zhao, Y**., & Chidziwisano, H. (under review). How Ethically Use AI in Higher Education: A Freirean Approach. *TechTrends.*
- **Zhao, Y**., & Hodge, L. (under review). Why Data Matters? Exploring Personal Data Relevance in a Data-art Inquiry Program. *Learning, Culture, and Social Interaction*
- **Zhao, Y.** (manuscript in preparation). What are They Talking about? Probing Youth Engagement with Transformer Model in an Informal Data-art Inquiry Program.

GRANTS

- Rosenberg, J., **Zhao, Y**., Reedy, A., Zahra, F., Rocconi, L., & Bentley, A. (under review). 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

- **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

- 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 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.
        - My responsibilities include redesigning and remodeling the content and structure of this course.
- **Teaching Assistant** (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.
        - Teaching assistants are responsible for leading discussion classes/threads that align with the topics covered in the professor's lectures, hosting 1-on-1 meetings with students, and grading assignments independently.
        - The instructional mode shift in Spring 20 was due to COVID-19.

PROFESSIONAL EXPERIENCES

- **Postdoctoral Research Associate** (Aug 2023 – present), University of Tennessee, Knoxville
    - o Project: Mathematizing, Visualizing, and Power (MVP): Appalachian Youth Becoming Data Artists for Community Learning (NSF DRL # 2215004)
    - o 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 a graduate-level educational data science course
- **Research Associate** (May 2017 – April 2018), Michigan State University
    - o Projects: Picky Birds 2.0 (a Chinese language learning app), Ogura Hyakunin Isshu (a Japanese poetry learning app)
    - o Duty: Leading the development of Picky Birds 2.0 and Ogura Hyakunin Isshu
- **Volunteering Teaching Assistant** (April 2018), Michigan State University
    - o Course: AL 444 Prototyping Experience Architecture
    - o Duty: Teaching User Experience (UX) design
- **Game Programmer** (June 2016 – May 2017), Michigan State University
    - o Project: Picky Birds 1.5 (a Chinese language learning app)
    - o Duty: Lead the programming of Picky Birds 1.5

INVITED TALKS

- **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
    - o Python, C#, R, & C++
- Data analysis tools
    - o Data processing, analysis, and visualization with Python
    - o Data processing and analysis with R
    - o Qualitative data analysis with Nvivo, Taguette, & Dedoose

- Research methods
  - Qualitative research methods (grounded theory methods, thematic analysis, discourse analysis, …)
  - Basic 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

- **Peer Reviewer**
  - 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.

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

SCHOLARSHIP, FELLOWSHIP, AND AWARDS

- **University of Tennessee, Knoxville**
  - o University of Tennessee Open Publishing Support Fund. (July 2024). $1,800
- **University of Wisconsin–Madison**
  - o UW-Madison the Graduate School Student Research Grants Competition. (May 2022). $1,500
  - o UW-Madison Department of Curriculum and Instruction Travel Grant. (April 2022). $500
  - o UW-Madison Department of Curriculum and Instruction Travel Grant. (Nov 2022). $500
  - o UW-Madison Department of Curriculum and Instruction Research Grant. (Mar 2022). $500
  - o 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
  - o 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**
  - o MA Merit Award, the Department of Media and Information, Michigan State University.
- **Unity Technologies**
  - o Unity Certified Developer (Certificate No. 201703UCD1654, March 2017 – March 2019).