Xintian Tu

Ph.D. Candidate in Learning Sciences
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EDUCATION

Indiana University, Bloomington, IN | ***Ph.D. in Learning Sciences*** Spring 2024 (Anticipate)
Major: Learning Sciences
Minor: Inquiry Methodology
Dissertation: Supporting young children's science modeling practices through embodied activities within an MR environment.
Committee: Dr. Joshua Danish, Dr. Cindy Hmelo-Silver, Dr. Jessica Lester, & Dr. Adam Maltese

Miami University, Oxford, OH | ***Master of Education***
Major: Educational Psychology
Graduate Certificate: Human Brain and Learning
Professional Development in Assessment and Evaluation
Thesis: The effects of video games on 6 - 12 years old children's science learning

Dalian Maritime University, Liaoning, China | ***Bachelor of Economics***
Major: Economics

RESEARCH EXPERIENCE

2022-present **Representations for Teachers as Learners (RepTaL)**
Funding: James McDonnell Foundation.
Co-PIs: Joshua Danish, Noel Enyedy, Cindy Hmelo-Silver, Meredith Park Rogers, Dionne Cross Francis, Robert Goldstone, & Jose Felipe Martinez
Focus: Understanding how elementary teachers think about representations as part of their science teaching.
Role: Leading data analysis and publication efforts. Facilitating data collection.
Link: http://theraptlab.org/projects/RepTal

2020-present **Generalized Embodied Modeling- Science through Technology Enhanced Play (GEM-STEP)**
Funding: National Science Foundation. No.1908632 & 1908791
Co-PIs: Joshua Danish, Noel Enyedy & Corey Brady
Focus: Exploring how youth learn within mixed reality (MR) environments by attending to both their individual embodied experience, and their social, collective experience of coordinating their movement as they explore the computer system.
Role: Supporting grant writing. Designing curriculum and MR environment. Collecting and analyzing data. Preparing publications.
Link: https://embodiedplay.org/

2019 **Engaging Chinese Migrant Girls in STEAM Learning through E-textile Workshop**
Funding: Martha and H.A.R Tilaar Faculty Support Fund, Indiana University
PI: Adam Maltese
Focus: Designing affordable learning activities to empower Asian-Pacific women in STEM education
Role: Co-author of the grant. Student PI. Designing workshop. Collecting and analyzing video data.

2016-2020 **Interactive Science through Technology Enhanced Play (iSTEP)**
Funding: National Science Foundation. No. 1628918
PI: Joshua Danish & Noel Enyedy
Focus: Understanding young children's science learning with different types of interactive tracking technology
Role: Designing curriculum and assessment. Collecting and analyzing data.

2016-2017 **Promoting Learning through Annotation of Embodiment (PLAE)**
Funding: National Science Foundation No. 1522945
PI: Joshua Danish & Noel Enyedy
Focus: Supporting young children's embodied learning within MR environment with annotation tools
Role: Designing curriculum and assessment. Collecting and analyzing data.

2015-2016 **The Effects of Video Games on 6 - 12 years old children's Brian and Science Learning**
PI: Doris Bergen & Joseph Schroer
Focus: Understanding how video games help young children learn about light reflection by analyzing their EEG data
Role: Collecting and analyzing EEG data.

2014-2016 **Learning through Digital Media & Field Trips: A Pilot Project for Young Children from Low-Income Families and Their Teachers in Butler County**
Funding: PNC Foundation
PI: Doris Bergen & Lena Lee
Focus: Design activities with digital media to support young children from low- income families, and English language learner.
Role: Collecting data. Leading field trip.

PUBLICATIONS

Journal Articles – Peer Reviewed

Tu, X., Danish, J., Humburg, M., Zhou, M., Mathayas, N., Enyedy, N.**,** & Jen, T. (2023). Understanding young children's science learning through embodied communication within an MR environment. Invited Special Issue for *International Journal of Computer Supported Collaborative Learning.*

Danish, J., Anton, G., Mathayas, N., Jen, T., Vickery, M., Lee, S., **Tu, X.,** Cosic, L., Zhou, M., Dim, E., Steinberg, S., Enyedy, N., & Ryan Z. (2022). Designing for Shifting Learning Activities. Journal of Applied Instructional Design

Tu, X., Georgen, C., Danish, J., & Enyedy, N. (2021). Elementary students learning science in a MR environment by constructing liminal blends through action on props. *Information and Learning Sciences.*

Davis, B., **Tu, X.,** Georgen, C., Danish, J. A., & Enyedy, N. (2019). The impact of different play activity designs on students' embodied learning. *Information and Learning Sciences*.

Tu, X. & Lee, L (2019) Helping children from low-income family learning science with digital media: A case study of using iPad in Mid-western preschool in U.S. *Zao Qi Jiao Yu (Early Education)*

Lee, L. & **Tu, X.** (2016). Integrating Digital Media as an Effective Science Learning Tool for Low-Income Preschoolers: iPad Instruction with a Social Development Approach. *Journal of Research in Childhood Education.*

Lee, L. & **Tu, X.** (2016). Mathematical learning with digital media for low-income preschool children: A case study of ELL and non-ELL. *International Journal of Early Childhood Learning.*

Journal Article in Preparation

Tu, X., & Danish, J.A. (submitted, under review) Embodied Modeling within an MR environment: Explore the dynamics of embodied learning. Invited to a special issue.

Humburg, M., Danish, J. A., **Tu, X.,** Georgen, C., Davis, B., Enyedy, N. (under review). Using scientific annotation tools to support collaborative embodied learning in elementary school classrooms. Submitted for review.

Lee, S., **Tu, X.,** Adebola, S., Keifert, D., Danish, J., & Enyedy, N. (under review) How Children Blend Feedback in a Mixed-Reality Environment for Collective Embodied Learning.

Conference Proceedings – Peer Reviewed

Tu, X., Danish, J., Ryan, Z., Vickery, M., Park Rogers, M., Hmelo-silver, C., & Phillips, A. (2024). Teaching with Representations: How Teachers' Perception Shift Their Science Teaching. *International Conference of the Learning Sciences 2024.*

Tu, X., & Danish, J. (2023). Designing Technology-enhanced Play Environment for Young Children's Science Modeling Practice. Learning, Design and Technology Symposium, LDT'23, Evanston, IL, U.S.A.

Humburg, M., Bell, A., Keifert, D, T., **Tu, X.**, Hmelo-Silver, C., Danish, A., Lee, S., Henrie, A., Park Rogers, M., Francis, D., & Enyedy, N. (2023). Learning to be a science teacher: The worries, joys, and vulnerabilities of exploring new pedagogies. *International Conference of the Learning Sciences 2023.* **(Naomi Miyake Outstanding Student Paper Award)**

Tu, X. (2022). Supporting Young Children's Science Modeling Practice within an MR Environment. *Learning Sciences Graduate Students Conference.*

Tu, X., Humburg, M., Mathayas, N., Zhou, M., & Danish, J. (2022). How embodiment helps students explain their ideas within an MR environment and content interviews [paper]. *International Conference of the Learning Sciences 2022. Volume ICLS Proceedings, 1225-1228,* Hiroshima, Japan (Online): International Society of the Learning Sciences.

Tu, X., Yang, J., Zhong, Q., Wang, C., & Maltese, A. (2022). E-textile Fashion: Designing Maker Activity for Chinese Migrant Girls [poster]. *International Conference of the Learning Sciences 2022. Volume ICLS Proceedings, 2130-2031,* Hiroshima, Japan (Online): International Society of the Learning Sciences.

Lee, S., **Tu, X.**, Adebola, S., Danish, J., & Enyedy, N. (2022). "We Made Liquid!": How Children Blend Feedback in a Mixed-Reality Environment for Collective Embodied Learning [paper]. *International Conference of the Learning Sciences 2022. Volume CSCL Proceedings, 219-215,* Hiroshima, Japan (Online): International Society of the Learning Sciences.

Mathayas, N., **Tu, X.**, Danish, J., Vogelstein, L., & Cosic, L. (2022). Building meaningful participation using embodied Mixed Reality technologies. *International Conference of the Learning Sciences 2022.*

Zhou, M., Vickery, M., & **Tu, X.,** (2021). An exploratory literature review on collective embodied activity and funds of knowledge. *Learning Sciences Graduate Students Conference.*

Tu, X., (2021). Using embodied play to support young children's understanding of science modeling**.** *International Conference of the Learning Sciences (ICLS) 2021.* ***(Paper for Doctoral Consortium)***

Mathayas, N., Danish, J., **Tu, X.,** Zhou, M., & Vickery, M. (2021). Social positioning in collective embodied models in an elementary STEM classroom. Paper presented in symposium: Movement, Authority, and Knowledge: Examining the Relationships in Embodied and Social Positioning for STEM Learning. *In de Vries, E., Hod, Y., & Ahn, J. (Eds.), Proceedings of the 15th International Conference of the Learning Sciences (pp. 843-850).* Bochum, Germany: International Society of the Learning Sciences.

Vickery, M., Danish, J., **Tu, X.,** & Zhou, M. (2021). Scientific Modeling Practices Through Perspective Taking in a Mixed Reality Embodied Learning Environment. In *Proceedings of the 15th International Conference of the Learning Sciences-ICLS 2021.* International Society of the Learning Sciences.

Tu, X., Georgen, C., Danish, J., & Enyedy, N (2020). Extended Embodiment: Physical and Conceptual Tools in a Mixed-Reality Learning Environment as Supports for Young Learners' Exploration of Science Concepts. In Gresalfi, M. and Horn, I. S. (Eds.). (2020). *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 3, 1269-1276.* Nashville, Tennessee: International Society of the Learning Sciences.

Tu, X., Danish, J., Humburg, M., Enyedy, N., & Keifert, D., (2020). Play and Embodiment: Designing for early elementary students' strengths. In symposium: Broadening Learning Sciences Theoretical lenses to understand young children's sensemaking. In Gresalfi, M. and Horn, I. S. (Eds.). (2020). *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020, Volume 1,* 390-397. Nashville, Tennessee: International Society of the Learning Sciences.

Davis, B., **Tu, X.,** Humburg, M., & Georgen, C. (2019). An analysis of guided play activities as supplemental tools for embodied science learning. *Learning Sciences Graduate Students Conference.* Evanston, IL.

Humburg, M., **Tu,X.,** Davis, B., Georgen, C., & Ryan, Z. (2019). Designing for exploration in elementary science: how the ordering of embodied activities can impact students' investigations of scientific mechanisms. *Learning Sciences Graduate Students Conference.* Evanston, IL.

Tu, X., Ryan, Z., Humburg, M., Davis, B., Georgen, C., & Danish, J. (2019). Exploring young children's uses of props in science inquiry activities. *Learning Sciences Graduate Students Conferences.* Evanston, IL

Tu, X., Danish, J., Georgen, C., Humburg, M., Davis, B., & Enyedy, N (2019). Examining how scientific modeling emerges through collective embodied play. In Lund, K., Niccolai., G., Lavoue, E., Hmelo-Silver, C., Gwen, G., & Baker, M., (Ed.), A Wide Lens: Combing Embodied, Enactive, Extended and Embedded Learning in Collaborative Settings: The 13th International Conference on Computer Supported Collaborative Learning (Vol. 2.).

Lyon, France: The International Society of the Learning Sciences. **(Nominee of Best Design Paper Award)**

Danish, J., Enyedy, N., Humburg, M., Davis, B., & **Tu, X.** (2019). Collective embodied activity and how different concepts map to social exploration. In Lund, K., Niccolai., G., Lavoue, E., Hmelo-Silver, C., Gwen, G., & Baker, M., (Ed.), A Wide Lens: Combing Embodied, Enactive, Extended and Embedded Learning in Collaborative Settings: The 13th International Conference on Computer Supported Collaborative Learning (Vol. 2.). Lyon, France: The International Society of the Learning Sciences.

Davis, B., **Tu, X.,** Danish, J., & Enyedy, N. (2018). The Structures of Embodied Play Activities and Their Impact on Students' Exploration of the Particulate Nature of Matter. In Kay, J. and Luckin, R. (Eds.) Rethinking Learning in the Digital Age: Making the Learning Sciences Count, *13th International Conference of the Learning Sciences (ICLS)* 2018, Volume 3. London, UK: International Society of the Learning Sciences.

Tu, X., Humburg, M., Davis, B., & Danish, J. (2017). Pre-made vs freeform annotation tools: Benefits and drawbacks of constraining students' scientific observation. *Learning Sciences Graduate Students Conference.* Bloomington, IN.

Davis, B., **Tu, X.,** Danish, J., & Enyedy, N (2017). The Impact of Play, Gesture, and Teacher Prompts on Student Explanations About the Particulate Nature of Matter. *Computer Supported Collaborative Learning (CSCL)* Annual Meeting, Philadelphia, PA, June 18-21, 2017.

Tu, X. & Lee, L. (2016). Enhancing Young Children's Learning of Science with iPads. In *Proceedings of Society for Information Technology & Teacher Education International Conference 2016* (pp. 1348-1355). Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

Book Chapter

Yang, J., **Tu, X.,** Kim, J., & Maltese, A. (2021). "Making with Children in Three Different Cultures: China, South Korea, and the U.S.A" , a chapter in the book*, World of Children: Perspectives and Connections in Sustainability during the Pandemic*, edited by Judith Lynne McConnell-Farmer (Mikkelson), Ed.D.

Invited Talk

Tu, X. (2023). Designing the Technology-enhanced Environment for Next-Generation. *Emerging Scholars Symposium,* East Carolina University.

Conference Presentations

Tu, X., (2024). Understanding How Roles Mediate Young Children's Science Learning within an Embodied Mixed Reality Environment. *Annual conference of the American Educational Research Association (AERA)*, Philadelphia, Pennsylvania

Tu, X., Danish, J., Ryan, Z., Vickery, A., Hmelo-Silver, C., & Park Rogers, M., (2024). Teaching with Representations: Elementary Teachers' Perceptions. *Annual conference of the American Educational Research Association (AERA)*, Philadelphia, Pennsylvania

Mathayas, N., Zhou, M., Danish, J., Vickery, M., Steinberg, S., Ryan Z., **Tu, X.,** & Devine, I., (2024). The Role of Embodied Modeling on Fifth Grade Students' Perspectives on

Ecosystems Thinking and Metamodeling. *Annual conference of the American Educational Research Associatio*n *(AERA)*, Philadelphia, Pennsylvania

Tu, X., Danish, J., Humburg, M., Hmelo-Silver, C., Park Rogers, M., Bell, A., & Lee, S. (2023). Understanding Teachers' Perceptions of Representations in Elementary Science Classrooms, *The Biennial Conference of European Association for Research on Learning and Instruction (EARLI),* Thessaloniki, Greece.

Tu, X., & Danish, J. (2023). From play to science modeling: Young Children Learning Pollination in an MR Environment. *Annual conference of the American Educational Research Associatio*n *(AERA),* Chicago, IL.

Tu, X., Danish, J., Humburg, M., Hmelo-Silver, C., Park Rogers, M., Bell, A., & Lee, S. (2023). Understanding teachers' perceptions of representations in elementary science education. *Annual conference of the American Educational Research Associatio*n *(AERA)*, Chicago, IL.

Humburg, M., Bell, A., **Tu, X.,** Danish, J., Keifert, D., Hmelo-Silver, C., Henrie, A., Park Rogers, M., Enyedy. (2023) "Sounds Very Joyful to Me": Emotional Engagement and Social Support in Teacher Professional Development. Paper accepted at the *Annual conference of the American Educational Research Associatio*n, Chicago, IL.

Tu, X., Danish, J., Enyedy, N., Ryan, Z., Jen, Tessaly., Vickery, M., Zhou, M. (2022). Breaking the 4th Dimension of Science Assessment: Role of Embodied Experience. Paper presented in symposium: Technologies for Situated, Grounded, Embodied Learning: The Unique Role of Extended Reality Experiences at the *Annual conference of the American Educational Research Associatio*n, San Diego, CA.

Lee, S., **Tu, X.,** Adebola, S., Danish, J., & Enyedy, N. (2022). Collective Feedback Students, Teachers, and Technology Working Together to Make Sense of States of Matter. Paper presented at the *Annual conference of the American Educational Research Associatio*n, San Diego, CA. **(SIG ATL/LS Best Student Paper)**

Zhou, M., Vickery, M., Danish, J., **Tu, X., &** Ryan, Z. (2022). The Role of Body in Goal Negotiation and Adoption During a Collective Modeling Activity. Paper presented at the *Annual conference of the American Educational Research Associatio*n, San Diego, CA.

Ryan, Z., Danish, J., **Tu, X.,** Davis, B., Zhou, M., & Vickery, M. (2022). Designing for Broadening Participation in an Embodied Learning Environment**.** Paper presented in symposium: Designing for Dignity Affirming Experiences: Leveraging Embodied Learning Toward Equity in Interaction at the *Annual conference of the American Educational Research Associatio*n, San Diego, CA.

Tu, X., Humburg, M., Danish, J., Davis, B., Ryan, Z., Vickery, M., Zhou, M., & Mathayas, N. (2021). Assessing young children's embodied learning of states of matter in a Mixed-Reality environment. Paper presented at the *Annual conference of the American Educational Research Associatio*n, Online.

Tu,X., Danish, J., Georgen, C., Humburg, M., & Enyedy, N. (2019). Play, Modeling, and Play-as-Modeling in early elementary science. Poster presented at the *Annual conference of the American Educational Research Associatio*n, Toronto, Canada.

Humburg, M., **Tu, X**., Danish, J., Georgen, C., Davis, B., & Enyedy, N. (2019). Comparing Young Students' Uses of Scientific Annotation Tools for Observing Peers' Embodiment.

Poster presented at the *Annual conference of the American Educational Research Associatio*n, Toronto, Canada.

Humburg, M., **Tu, X.,** Davis, B. (2018). Designing for innovative uses of embodiment in learning. Workshop organized at the *Learning Sciences Graduate Students Conferences.* Nashville, TN.

Humburg, M., Keifert, D., Georgen, C., Lee, C., **Tu, X.**, Danish, J., & Enyedy, N. (2018). The challenge of consistency in sensemaking resources across play and assessment for young science learners. Paper presented at the Annual conference of the American Educational Research Association, New York, NY.

Danish, J., Keifert, D., Enyedy, N., Humburg, M., **Tu, X.**, Davis, B., & Lee, C. (2018). Embodiment Within Computational Models: Explorations of Agency and Normativity. Paper presented at the Annual conference of the American Educational Research Association, New York, NY.

Tu, X., & Lee, L. (2015). Enhancing mathematical learning of preschool children with special needs through digital media. *Mid-West Education Research Association (MWERA) Conference,* Evanston, IL. October 21-24, 2015.

TEACHING EXPERIENCE

2021-2022	**Orientation for Associate Instructor,** Indiana University Designer and co-facilitator, Center of Innovative Teaching and Learning
2020-2022	**P251 Educational Psychology for Elementary Teachers**, Indiana University Associate Instructor, Department of Counseling and Educational Psychology
2020-2022	**M101 Field Experience,** Indiana University Associate Instructor, Department of Counseling and Educational Psychology
2019	**Chinese flagship program,** Indiana University Teaching assistant, Hamilton Lugar School of Global and International Studies

GRANTS

2021	**Collaborative Research: Collaboration Reviewer: Supporting Collaborative Learning in Immersive Science Environments Using Scalable AI-Driven Content Delivery Data Visualization** Funding: RETTL Co-author (Not Funded)
2020	**Generalized embodied Modeling- Science through Technology Enhanced Play (GEM-STEP)** Funding: National Science Foundation. No.1908632 & 1908791 Co-PIs: Joshua Danish, Noel Enyedy & Corey Brady Co-author of the application
2019	**Engaging Chinese Migrant Girls in STEAM Learning through E-textile Workshop** Funding: Martha and H.A.R Tilaar Faculty Support Fund, Indiana University Student PI (Funded)

HONORS AND AWARDS

2024	**Mentor Program,** American Educational Research Association (AERA) SIG ATL/LS, **2024 Cohort**
2023	**Emerging Scholars Symposium,** East Carolina University 2023 Fall cohort
2023	**Naomi Miyake Outstanding Student Paper,** International Conference of Learning Sciences (ICLS) Co-author
2023	**Travel Awards for Emerging Scholars,** ACM Interaction Design and Children (IDC) Conference $250
2022	**Best Student Paper,** American Educational Research Association (AERA) SIG ATL/LS, co-author with Sarah Lee
2022	**Frieda Alice Renfro Fellowship**, Indiana University $2,100
2021	**Doctoral Consortium,** International Society of Learning Sciences (ISLS) Awardee
2021	**Graduate and Professional Student Government Travel Award**, Indiana University $250
2019	**Nominee of Best Design Paper,** the 13th International Conference on Computer Supported Collaborative Learning. (CSCL) Lyon, France. Lead author
2017-2023	**CRLT Travel Scholarship**, Indiana University $300-$500
2016-2020	**Counseling and Educational Psychology Department Faculty Fellowship**, Indiana University
2015	**Summer Scholarship**, Miami University $1,500

PROFESSIONAL MEMBERSHIP

American Educational Research Association (AERA)

International Society of the Learning Sciences (ISLS)

Association for Computing Machinery: SIG Computer-Human Interaction (ACM SIGCHI)

PROFESSIONAL SERVICES – Professional Society

2023-2024	***International Society of the Learning Sciences (ISLS)*** *Membership Committee- ILSSA representative* *Financial Concern Evaluation Committee- ILSSA representative*
2023-2024	***ISLS International Learning Sciences Student Association (ILSSA)*** *Committee*
2023	***ACM SIGCHI Interaction Design and Children (IDC) Conference*** *Student volunteer.*
2023	***AI Center for Integrative Research in Computing and Learning Sciences (CIRCLS)*** *Mock Review Panel* *Community member*

2019	***Learning Science Graduate Students Conference (LSGSC)*** IU representative, social media team, Reviewer

PROFESSIONAL SERVICES – Review

Computers & Education *Reviewer*	2024
Instructional Science *Reviewer*	2024
ACM- CHI Computer-Supported Cooperative Work *Reviewer*	2024
Annual Meeting of International Society of the Learning Sciences (ISLS) *Reviewer*	2020-2024
American Educational Research Association (AERA) *SIG ATL/LS, Reviewer*	2020-2024
ChatGPT and Global Higher Education: Using Artificial Intelligence in Teaching and Learning *Book chapter reviewer*	2023
STAR Scholar Books *Reviewer*	2023
Learning Sciences Graduate Students Conference (LSGSC) *Reviewer*	2018-2023
Educational Technology & Society (ET&S) *Reviewer*	2021

PROFESSIONAL SERVICES – Indiana University

2020-2022	***Center of Innovative Teaching and Learning****,* Indiana University *Facilitator for Associate Instructor Orientation*
2022	***Faculty Search Committee****,* Indiana University *Student representative*
2020	***Learning Science Graduate Students Association****,* Indiana University Vice President, Treasure
2018	***Learning Science Graduate Students Association,*** Indiana University Secretary

PROFESSIONAL SKILLS

Languages: R, MATLAB, JavaScript

Research software: Atlas. ti, SPSS, WINSTEPS (Rasch Model), Transana, InqScribe, MAXQDA

Media editors: Camtasia, Kaltura

Tracking system/tool: LEAP, OpenPtrack, Pozyx

LANGUAGE SKILLS

Professional fluent in English, Mandarin

Literate in Japanese

CERTIFICATE

Educational Data Mining **2023**

Carnegie Mellon University, Learn Lab Summer School

Licensed Counseling Psychologist, Level 3 **2014**

Ministry of Human Resources of the People's Republic of China