

## JENNIFER L. CHIU

Department of Curriculum, Instruction, and Special Education

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### A. PERSONAL DATA

#### EDUCATION

Stanford University, B.S., Engineering (Product Design), 2000

University of California, Berkeley, M.A., Education in Science, Mathematics and Technology, 2007

University of California, Berkeley, Ph.D., Education in Science, Mathematics and Technology, 2010

#### PROFESSIONAL APPOINTMENTS

2023-present Director, Global Center for Equitable Computer Science Education, University of Virginia/University of Virginia-WISE/Universidad del Norte, Colombia

2017-present Associate Professor, School of Education and Human Development, University of Virginia

2010-2017 Assistant Professor, School of Education and Human Development, University of Virginia

2004-2010 Technology-Enhanced Learning in Science (TELS) Center Fellow, U.C. Berkeley

2006-2007 Graduate Student Instructor, Department of Physics, University of California, Berkeley

2003-2004 High School Math and Science Teacher, Woodside Priory School, Portola Valley, CA

2001-2003 High School Math and Science Teacher, Holland Hall School, Tulsa, OK

2000-2001 Product Engineer, Mobile Computing Division, Hewlett Packard, Cupertino, CA

### B. SCHOLARSHIP

#### PEER-REVIEWED JOURNAL ARTICLES

(\*designates advisee/postdoctoral fellow)

1. \*Lilly, S., McAlister, A., Fick, S., & **Chiu, J. L.** (2023, accepted). A Comparison of Elementary Teachers' Verbal Supports for Students in Inclusive and General Classroom Contexts During an NGSS-Aligned Science, Engineering, and Computer Science Unit. *Science Education*, <https://doi.org/10.1002/sce.21788>
2. \*McAlister, A., \*Lilly, S., Bailey, R. & **Chiu, J. L.** (2023, accepted). The many roles of an engineering graduate student: Exploring how graduate students identify with the multiple roles they assume. *International Journal of Engineering Education*.
3. Mumba, F. Rutt, A., Bailey, R., Pottmeyer, L., van Aswegen, R., **Chiu, J. L.**, & Ojeogwu, J. (2023, accepted). A Model for Integrating Engineering Design into Science Teacher Education. *Journal of Science Education and Technology*.
4. \*McAlister, A., \*Lilly, S., & **Chiu, J. L.** (2022). Exploring factors that impact physical science doctoral student role identities through a multiple case study approach. *Science Education*. 106(6), 1501-1534, <http://doi.org/10.1002/sce.21754>

5. Bywater, J., \*Lilly, S., & **Chiu, J. L.** (2022). Examining technology-supported teacher responding and students' written mathematical explanations. *Journal of Mathematics Teacher Education*. Online first, <https://doi.org/10.1007/s10857-022-09546-3>
6. Rates, C., Mulvey, B., \*Stenger, K., & **Chiu, J. L.** (2022). Examining ontological and self-monitoring scaffolding to improve complex systems thinking with a participatory simulation. *Instructional Science*, 50, 199-221. <https://doi.org/10.1007/s11251-021-09573-2>
7. \*Lilly, S., \*McAlister, A., Fick, S., **Chiu, J. L.**, & McElhaney, K. (2022). Elementary teachers' verbal supports of science and engineering practices in an NGSS-aligned science, engineering, and computational thinking unit. *Journal of Research in Science Teaching*, 59(6), 1035-1064. <https://doi.org/10.1002/tea.21751>
8. Fick, S., **Chiu, J. L.**, & McElhaney, K. M. (2022). An examination of elementary classroom dialogue: Implicit and explicit use of the NGSS crosscutting concepts in an integrated STEM unit. *Journal of Science Teacher Education*, 33(4), 435-457. <https://doi.org/10.1080/1046560X.2021.1961974>
9. \*McAlister, A., Bywater, J., & **Chiu, J. L.** (2022). Exploring experienced designers' strategies in a CAD learning environment. *Computer Applications in Engineering Education*, 30(1), 42-63. <https://doi.org/10.1002/cae.22441>
10. \*Lilly, S., **Chiu, J. L.**, & McElhaney, K. M. (2021). Interdisciplinary knowledge for teaching: A framework for epistemological support in elementary classrooms. *Journal of the Korean Society of Mathematical Education Series D: Research in Mathematical Education*, 24(3), 137173. <https://doi.org/10.7468/jksmed.2021.24.3.137>
11. \*Lilly, S., \*McAlister, A. M., & **Chiu, J. L.** (2021). Elementary Teachers' Verbal Support of Engineering Integration in an Interdisciplinary Project. *Journal of Pre-College Engineering Education Research (J-PEER)*, 11(2), Article 6. \*\*\* Best Diversity, Equity, and Inclusion Paper Award for Pre-college Engineering Education at the ASEE 2021 Conference. <https://doi.org/10.7771/2157-9288.1339>
12. **Chiu, J. L.**, Fick, S., McElhaney, K. W., Alozie, N., & Fujii, R. (2021). Elementary teacher adaptations to engineering curricula to leverage student and community resources. *Journal of Pre-college Engineering Education Research, Special Issue: Asset-Based Pre-College Engineering Education to Promote Equity*. 11(1), 5. <https://doi.org/10.7771/2157-9288.1283>
13. Magana, A., **Chiu, J. L.**, Seah, Y., Bywater, J., Schimpf, C., Karabiyik, T., Rebello, S., & Xie, C. (2021). Classroom orchestration of computer simulations for science and engineering learning: A multiple-case study approach. *International Journal of Science Education*. 43(7), 1140-1171. <https://doi.org/10.1080/09500693.2021.1902589>
14. Fick, S., \*McAlister, A., **Chiu, J. L.**, & McElhaney, K. W. (2021). Using students' conceptual models to represent understanding of crosscutting concepts in an NGSS-aligned curriculum unit about urban water runoff. *Journal of Science Education and Technology*. 30, 678-691.

<https://doi.org/10.1007/s10956-021-09911-6>

15. Barton, E., Brown, D., & **Chiu, J. L.** (2020). Tracking Down the Secret Sauce for Empowering Students with Technology. *Educational Leadership*, 77(6), 72-77.
16. \*Bywater, J., **Chiu, J. L.**, \*Hong, J., & \*Sankaranarayanan, V. (2019). The Teacher Responding Tool: Scaffolding the Teacher Practice of Responding to Student Ideas in Mathematics Classrooms. *Computers & Education*, 139, 16-30.  
<https://doi.org/10.1016/j.compedu.2019.05.004>
17. Wheeler, L., **Chiu, J. L.**, Maeng, J. L., & Bell, R. L. (2019). An exploratory study of teaching assistants' motivation for inquiry-based teaching in an undergraduate laboratory context. *Chemistry Education Research and Practice*, 20(1), 53-67.  
<https://doi.org/10.1039/C8RP00157J>
18. Merritt, E., **Chiu, J. L.**, Peters-Burton, E., & Bell, R. (2018). Teacher enactment of scientific and engineering practices in primary classrooms. *Research in Science Education*. 48(6), 1321-1337. <https://doi.org/10.1007/s11165-016-9604-0>
19. \*Whitworth, B., Maeng, J., \*Wheeler, L., & **Chiu, J. L.** (2017). Investigating the role of a district science coordinator. *Journal of Research in Science Teaching*, 54(7), 914-936.  
<https://doi.org/10.1002/tea.21391>
20. **Chiu, J. L.**, \*Gonczi, A., Fu, X. & Burghardt, M. D. (2017). Supporting informed engineering design across formal and informal contexts with WISEngineering. *International Journal of Engineering Education, Special Issue: Current Trends in K-12 Engineering Education*, 33(1), 371-381.
21. Chabalengula, V., \*Bendjemil, S., Mumba, F., & **Chiu, J. L.** (2017). Nature and extent of science and engineering practices coverage in K-12 engineering curriculum materials. *International Journal of Engineering Education, Special Issue: Current Trends in K-12 Engineering Education*, 33(1), 308-320.
22. \*Wheeler, L., Maeng, J., **Chiu, J. L.**, & Bell, R. (2017). Do teaching assistants matter? Investigating relationships between teaching assistants and student outcomes in undergraduate science laboratory classes. *Journal of Research in Science Teaching*, 54(4), 463-492.  
<https://doi.org/10.1002/tea.21373>
23. \*Gonczi, A. L., **Chiu, J. L.**, Maeng, J. L., & Bell, R. L. (2016). Instructional support and implementation structure during elementary teachers' science education simulation use. *International Journal of Science Education*, 38(11), 1800-1824.  
<https://doi.org/10.1080/09500693.2016.1217363>
24. \*Gonczi, A., **Chiu, J. L.**, & \*Pan, E. (2016). WISEngineering hydroponics: A technology-enhanced life science engineering design unit. *Science Scope*, 39(9), 19-25.

25. \*Mulvey, B., Chiu, J. L., Ghosh, B., & Bell, R. (2016). Special education teachers' nature of science instructional experiences. *Journal of Research in Science Teaching*, 53(4), 554-478. <https://doi.org/10.1002/tea.21311>
26. \*Wheeler, L.B., **Chiu, J. L.**, & Grisham, C.M. (2016). Computational methods in general chemistry: Perceptions of programming, prior experience, and student outcomes. *Journal of College Science Teaching*, 45(3), 83-91. [https://doi.org/10.2505/4/jcst16\\_045\\_03\\_83](https://doi.org/10.2505/4/jcst16_045_03_83)
27. \*Chao, J., **Chiu, J. L.**, \*DeJaegher, C., & \*Pan, E. (2016). Sensor-augmented virtual labs: Using physical interactions with science simulations to promote understanding of gas behavior. *Journal of Science Education and Technology*, 25(1), 16-33. <https://doi.org/10.1007/s10956015-9574-4>
28. \*Pan, E., **Chiu, J. L.**, Inkelas, K., Garner, G., Russell, S., & Berger, E. (2015). Affordances and constraints of physical and virtual manipulatives for learning dynamics. *International Journal of Engineering Education*, 31(6), 1629-1644.
29. **Chiu, J. L.**, \*DeJaegher, C., & \*Chao, J. (2015). The effects of augmented virtual science laboratories on middle school students' understanding of gas properties. *Computers & Education*, 85, 59-73. <https://doi.org/10.1016/j.compedu.2015.02.007>
30. \*Whitworth, B., & **Chiu, J. L.** (2015). Professional development and teacher change: The missing leadership link. *Journal of Science Teacher Education*, 26(2), 121-137. <https://doi.org/10.1007/s10972-014-9411-2>
31. McElhaney, K., Chang, H. Y., **Chiu, J. L.**, & Linn, M. C. (2015). Evidence for effective uses of dynamic visualizations in science curriculum materials. *Studies in Science Education*, 51(1), 49-85. <https://doi.org/10.1080/03057267.2014.984506>
32. **Chiu, J. L.**, & Linn, M. C. (2014). Supporting knowledge integration in chemistry with a visualization-enhanced inquiry unit. *Journal of Science Education and Technology*, 23(1), 37-58. <https://doi.org/10.1007/s10956-013-9449-5>
33. \*Whitworth, B., **Chiu, J. L.**, & Bell, R. (2014). Kinesthetic investigations in the physics classroom. *The Physics Teacher*, 52(2), 91-93.
34. **Chiu, J. L.**, Hecht, D., \*Malcolm, P., \*DeJaegher, C., \*Pan, E., Bradley, M., & Burghardt, M. D. (2013). WISEngineering: Supporting precollege engineering design and mathematical understanding. *Computers & Education*, 67, 142-155. <https://doi.org/10.1016/j.compedu.2013.03.009>
35. \*Whitworth, B., & **Chiu, J. L.** (2013). Pre-service teachers' use of visualizations in the science classroom: A case study. *Journal of Virginia Science Education*, 5(1), 16-33.
36. Linn, M.C., & **Chiu, J. L.** (2011). Combined learning and assessment to improve science education. *Research and Practice in Assessment*, 5, 5-13.

37. **Chiu, J. L.**, & Linn, M. C. (2011). Knowledge integration and WISE engineering. *Journal of Pre-college Engineering Education Research*, 1(1), 1-14.  
<https://doi.org/10.7771/21579288.1026>
38. Linn, M. C., Lee, H. –S., Tinker, R., Husic, F., & **Chiu, J. L.** (2006). Teaching and assessing knowledge integration in science. *Science*, 313, 1049-1050.  
<https://doi.org/10.1126/science.1131408>

## PEER-REVIEWED BOOK CHAPTERS

1. **Chiu, J. L.**, Bywater, J., & \*Lilly, S. (2022). The role of AI to support teacher learning and practice: A review and future directions. In A. Alavi, P. Jiao, B. McLaren, & F. Ouyang (Eds.), *Artificial Intelligence in STEM Education: The Paradigmatic Shifts in Research, Education, and Technology* (pp. 163-174). Auerbach/CRC Press.
2. **Chiu, J. L.** (2017). Community Technology Centers. In K. Peppler (Ed.), *Encyclopedia of Out-of-School Learning* (pp. 110). Thousand Oaks, CA: Sage.
3. **Chiu, J. L.**, & \*Merritt, E. (2017). Digital Media and Learning. In K. Peppler (Ed.), *Encyclopedia of Out-of-School Learning* (pp. 220-221). Thousand Oaks, CA: Sage.
4. **Chiu, J. L.** (2015). Scientific Visualizations. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 951-955). New York: Springer Reference.
5. **Chiu, J. L.**, & \*Pan, E. (2015). 3D Printing and Rapid Prototyping. In M. Spector (Ed.), *Encyclopedia of Educational Technology* (pp. 769-772). Los Angeles, CA: Sage.
6. **Chiu, J. L.**, & Chi, M. T. H. (2014). Supporting self-explanation in the classroom. In V.A. Benassi, C.E. Overson, & C.M. Hakala (Eds.), *Applying science of learning in education: Infusing psychological science into the curriculum*. Retrieved from the Society for the Teaching of Psychology web site: <http://teachpsych.org/ebooks/asle2014/index.php>
7. Bull, G., **Chiu, J. L.**, Berry, R. Q., Lipson, H., & Xie, C. (2014). Advancing children’s engineering through desktop manufacturing. In J. Spector, M. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of Research on Educational Communications and Technology* (pp. 675-688). New York, NY: Springer.
8. \*Pan, E., **Chiu, J. L.**, & \*Chao, J. (2014). Mixed reality labs: Combining sensors and simulations to improve STEM education. In R. Yager & H. Brunkhorst (Eds.), *Exemplary STEM programs: Designs for success* (pp. 251-262). Arlington, VA: National Science Teachers Association Press.
9. **Chiu, J. L.**, Bull, G., Berry, R. Q., & Kjellstrom, W. (2013). Teaching engineering design with digital fabrication: imagining, creating, and refining ideas. In N. Levine & C. Mouza (Eds.),

*Emerging Technologies for the Classroom: A Learning Sciences Perspective* (pp. 47-62). New York: Springer.

10. **Chiu, J. L.**, King Chen, J., & Linn, M. C. (2013). Overcoming deceptive clarity by encouraging metacognition in the web-based inquiry science environment. In R. Azevedo & V. Aleven (Eds.), *International Handbook of Metacognition and Learning Technologies* (pp. 517-531). New York: Springer.
11. **Chiu, J. L.**, & Linn, M. C. (2012). The role of self-monitoring in learning chemistry with dynamic visualizations. In J. Dori & A. Zohar (Eds.) *Metacognition and Science Education* (pp.133-164). Mahwah, NJ: Lawrence Erlbaum.
12. Linn, M. C., Chang, H. Y., **Chiu, J. L.**, Zhang, H., & McElhaney, K. (2010). Can desirable difficulties overcome deceptive clarity in scientific visualizations? In A. Benjamin (Ed.), *Successful remembering and successful forgetting: a Festschrift in honor of Robert A. Bjork* (pp. 239-262). New York: Taylor & Francis.
13. Clark, D. B., Varma, K., McElhaney, K., & **Chiu, J. L.** (2008). Structure and design rationale within TELS projects to support knowledge integration. In D. Robinson & G. Schraw (Eds.), *Recent Innovations in Educational Technology That Facilitate Student Learning* (pp. 157-193). Charlotte, NC: Information Age Publishing.

#### **PEER-REVIEWED CONFERENCE PROCEEDINGS**

1. \*Datta, D., Phillips, M., Bywater, J., \*Lilly, S., **Chiu, J. L.**, Watson, G., & Brown, D. (2022). Human-in-the-Loop Data Collection and Evaluation for Improving Mathematical Conversations. In *Rodrigo, M.M., Matsuda, N., Cristea, A.I., Dimitrova, V. (eds) Artificial Intelligence in Education. 551-554*. Springer, Cham. [https://10.1007/978-3-031-116476\\_113](https://10.1007/978-3-031-116476_113)
2. Basu, S., McElhaney, K., Rachmatullah, A., Hutchins, N., Biswas, G., & **Chiu, J.** (2022). Promoting computational thinking through science-engineering integration using computational modeling. In Chinn, C., Tan, E., Chan, C., & Kali, Y. (Eds.) *Proceedings of the 16th International Conference of the Learning Sciences – ICLS 2022*, 743-750.
3. \*Lilly, S., \*McAlister, A., & **Chiu, J. L.** (2022). Exploring elementary teachers' perceptions of teaching a science, engineering, mathematics, and computer science interdisciplinary project. In Chinn, C., Tan, E., Chan, C., & Kali, Y. (Eds.) *Proceedings of the 16th International Conference of the Learning Sciences – ICLS 2022*, 1325-1329.
4. \*Lilly, S., \*McAlister, A., & **Chiu, J. L.** (2022). Teachers' beliefs in enacting an engineering project in inclusive and general classroom contexts. Annual meeting of the American Society for Engineering Education.
5. Bywater J. P., Floryan, M., & **Chiu J. L.** (2021). DiSCS: A new sequence segmentation method for open-ended learning environments. In I. Roll, D. McNamara, S. Sosnovsky, R. Luckin, V. Dimitrova (Eds.) *AIED 2021: Artificial Intelligence in Education*, vol 12748. Springer, Cham. [https://doi.org/10.1007/978-3-030-78292-4\\_8](https://doi.org/10.1007/978-3-030-78292-4_8)

6. Hutchins, N.M., Basu, S., McElhaney, K., **Chiu, J. L.**, Fick, S., Zhang, N., & Biswas, G. (2021). Coherence across conceptual and computational representations of students' scientific models. In E. de Vries, J. Ahn, & Y. Hod (Eds.), *15th International Conference of the Learning Sciences – ICLS 2021* (pp. 330-337). International Society of the Learning Sciences.
7. \*Lilly, S., \*Shepherd, S., \*McAlister, A., & **Chiu, J. L.**, (2021). Student perceptions in a formal makerspace: A case study of two high school senior students and their collaboration on a computer-aided design project. In E. de Vries, J. Ahn, & Y. Hod (Eds.), *15th International Conference of the Learning Sciences – ICLS 2021* (pp. 749-753). International Society of the Learning Sciences.
8. \*McAlister, A. M., & \*Lilly, S. C., & **Chiu, J. L.** (2021), A Framework for Examining Engineering Doctoral Student Identity. In *Proceedings of the 2021 American Society for Engineering Education*. <https://doi.org/10.18260/1-2--36580>
  - *Best Student Paper for the Graduate Studies Division.*
9. \*Stenger, K., **Chiu, J. L.**, Fick, S. J. (2021). “Adding stuff from other people”: How peer comparison influences conceptual modeling in precollege engineering contexts. In *Proceedings of the American Society for Engineering Education*.
10. \*Datta, D., \*Phillips, M., Bywater, J. P., **Chiu, J. L.**, Watson, G. S., Barnes, L., & Brown, D. (2021). Virtual Pre-Service Teacher Assessment and Feedback via Conversational Agents. In *Proceedings of the 16th Workshop on Innovative Use of NLP for Building Educational Applications* (pp. 185-198).
11. Zhang N., Biswas G., McElhaney K.W., Basu S., McBride E., **Chiu J. L.** (2020). Studying the interactions between science, engineering, and computational thinking in a learning-bymodeling environment. In Bittencourt I., Cukurova M., Muldner K., Luckin R., Millán E. (Eds.) *AIED 2020: Artificial Intelligence in Education*, vol 12163, 598-609. Springer, Cham. [https://doi.org/10.1007/978-3-030-52237-7\\_48](https://doi.org/10.1007/978-3-030-52237-7_48)
12. McElhaney, K.W., \*Zhang, N., Basu, S., McBride, E., Biswas, G., & **Chiu, J. L.** (2020). Using computational modeling to integrate science and engineering curricular activities. *Proceedings of the 14<sup>th</sup> international conference of the learning sciences*. International Society of the Learning Sciences.
13. \*Lilly, S., \*McAlister, A., Fick, S., **Chiu, J. L.**, & McElhaney, K. (2020). Supporting upper elementary students' engineering practices in an integrated science and engineering unit. *Proceedings of the American Society for Engineering Education*. <https://doi.org/10.18260/1-2--35258>
14. \*Bywater, J. P., **Chiu, J. L.**, & Watson, G. S. (2019). Assessing the effectiveness of an intelligent tool that supports targeted teacher responses to student ideas. *Proceedings of the International Convention of the Association for Educational Communications and Technology – Volume 1* (pp. 45-53). Oct 21-25. Las Vegas, NV.

15. Zhang, N., Biswas, G., **Chiu, J. L.**, & McElhaney, K. W. (2019). Analyzing students' design solutions in an NGSS-aligned earth sciences curriculum. In *International Conference on Artificial Intelligence in Education* (pp. 532-543). Springer, Cham.
16. Hecht, D., **Chiu, J. L.**, Bridgelal, I., Burghardt, D. (2018). Supporting engineering practices in informal environments with a tablet-based engineering design environment. *Proceedings of the 2018 IEEE Integrated STEM Education Conference (ISEC)*, 228-232, Princeton, NJ.
17. Fu, X., Befferman, T., **Chiu, J. L.**, & Burghardt, M. (2015). WISEngineering: Achieving scalability and extensibility in massive online learning. *Proceedings of the 16<sup>th</sup> International Conference on Web Information System Engineering*, Miami, FL.
18. \*DeJaegher, C., & **Chiu, J. L.** (2014). Investigating secondary students' engagement with web-based engineering design practices. *Proceedings of the Annual Conference of the American Society for Engineering Education*, Indianapolis, IN.
19. Burghardt, M. D., **Chiu, J. L.**, & Hecht, D. (2013). Infusing informed engineering design pedagogy in K-12 math and science courses. *Proceedings of the Hawaii International Conference on Education*, Honolulu, HI.
20. Lewin, G., Haj-Hariri, H., Bull, G., **Chiu, J. L.**, Bredder, E., Kjellstrom, W., Malcolm, P., & Standish, N. (2013). Enhancing engineering education and K-12 science teaching through advanced manufacturing. *Proceedings of the Research and Education in Mechatronics Conference*, Vienna, Austria.
21. \*Dejaegher, C., **Chiu, J. L.**, Burghardt, M. D., Hecht, D., \*Malcolm, P., & \*Pan, E. (2012). Learning common core mathematics concepts with WISEngineering. *Proceedings of the Annual Conference of the American Society for Engineering Education*, San Antonio, TX.
22. \*Malcolm, P., **Chiu, J. L.**, \*Pan, E., Burghardt, M. D., & Hecht, D. (2012). WISEngineering: A web-based engineering design learning environment. *Proceedings of the Annual Conference of the American Society for Engineering Education*, San Antonio, TX.
23. Gerard, L. F., Tate, E., **Chiu, J. L.**, Corliss, S. B., & Linn, M. C. (2009). Collaboration and knowledge integration. In *International Perspectives in the Learning Sciences: Proceedings of the 8th International Conference of Computer Supported Collaborative Learning* (pp. 188–193). Rhodes, Greece: International Society of the Learning Sciences, Inc.

## GRANTS

### *Funded Grants*

1. **Chiu, J. L.**, Vieira, C., Carter, K. (\$100,000, 6/1/2023-12/1/2025). Global Center for Equitable Computer Science Education. UVA Center for Global Inquiry and Innovation. Principal Investigator.



2. Bywater, J., Chiu, J. L., Watson, G. (\$29,965, 7/1/2023-6/30/2024). Co-designing Simulations to Support Mathematical Discourse in Schools. 4-VA Advancing the Commonwealth Research Scale-up Grant. Co-Principal Investigator.
3. Rowley, S., **Chiu, J. L.**, McGraw, J., Van Hover, S., et al. (\$200,000, 2/1/2023-5/31/2024). College Partnership Laboratory School Planning Grant. Virginia Department of Education. Co-Principal Investigator.
4. **Chiu, J. L.**, Vieira, C. (\$20,000; 12/13/2022 – 12/12/2023). Global Center for Equitable Computer Science. UVA Center for Global Inquiry and Innovation. Principal Investigator.
5. Therrien, W., **Chiu, J. L.**, Cook, B., Doabler, C., Wong, V. (\$2,500,000; 7/01/2022-6/30/2025). Science Education Instruction for Elementary Students with Learning Disabilities. National Science Foundation. Co-Principal Investigator.
6. Harris, D., **Chiu, J. L.**, Campbell, B., Apostolellis, P. (\$300,000; 10/1/2021 – 9/30/2023). EAGER: Adaptive Digital Twinning: An Immersive Visualization Framework for Structural Cyber-Physical Systems. National Science Foundation. Co-Principal Investigator.
7. Crowder, A., **Chiu, J. L.**, Cormier, D., Gay, M., Mosby, M. (\$999,985; 8/1/2020 – 4/30/2024). Computer Science For and By Teachers: An Integrative Toolkit for 3<sup>rd</sup>-5<sup>th</sup> Grade Classrooms. National Science Foundation. Co-Principal Investigator.
8. Kennedy, M., **Chiu, J. L.**, & Therrien, B. (\$2,496,450; November 1, 2019-October 31, 2024). Project S4: Supporting Student Science Success Through Multimedia Learning and Teacher Professional Development. Department of Education, Office of Special Education Programs. Co-Principal Investigator.
9. Pianta, R., **Chiu, J. L.**, Cohen, J.L. Deutsch, N., Youngs, P., et al. (\$2,200,000; June 1, 2020 – May 31, 2023). Robertson Innovations in Education - Classroom Simulation for Teacher Preparation. Robertson Foundation. Co-Principal Investigator.
10. **Chiu, J. L.**, Cleckley, E., & Saunders, S. (\$38,437; May 1, 2020 – May 31, 2023) Creating Educational Citizen-Leaders through Service Learning. The Jefferson Trust. Principal Investigator.
11. Standish, N., **Chiu, J.L.**, Tychonievich, L. (\$372,000; January 1, 2020 – December 31, 2023). Creating Equitable and Integrated Computer Science Experiences for All Students. Virginia Department of Education. Co-Principal Investigator.
12. Basu, S., **Chiu, J. L.**, Biswas, G., & McElhaney, K., (\$2,699,962; September 1, 2017 - August 1, 2022). A Study of a Technology-Enhanced Curriculum Integrating Science, Engineering Design, and Computational Modeling to Achieve Synergistic Learning with Elementary Students. National Science Foundation STEM+C Program. Co-Principal Investigator.
13. **Chiu, J. L.**, Wheelock, M. (\$199,690; July 1, 2017 – June 30, 2022). Educational Design Initiative. University of Virginia Curry Innovation Funds. Principal Investigator.

14. **Chiu, J. L.**, & Richards, L. (\$399,113; June 1, 2015 - May 31, 2020). Collaborative Research: SmartCAD: Guiding Engineering Design with Science Simulations. National Science Foundation Discovery Research K-12. Principal Investigator.
15. **Chiu, J. L.**, Bull, G., & Comazzi, J. (\$60,000; August 1, 2018 – December 1, 2019). Designing Technology-Enhanced Learning Environments for Collaboration. University of Virginia 3 Cavaliers Grant. Principal Investigator.
16. Mumba, F., **Chiu, J. L.**, Bailey, R., & Hoon, J. (\$325,000; August 1, 2016 – July 31, 2021). Developing Pre-service Science Teachers' Pedagogical Content Knowledge for Engineering Design Integrated Science Teaching and Assessing the Impact on Student Learning. National Science Foundation Engineering Education Program. Co-Principal Investigator.
17. Mumba, F., **Chiu, J. L.**, Tai, R., Richards, L., & Chabalengula, V. (\$1,284,321; August 1, 2014 - July 31, 2021). University of Virginia Robert Noyce Scholarship Program. National Science Foundation Division of Undergraduate Education. Co-Principal Investigator.
18. **Chiu, J. L.** (\$513,283; June 1, 2013 - May 31, 2019). CAREER: Scaffolding Engineering Design to Develop Integrated STEM Understanding with WISEngineering. National Science Foundation Early Career Award. Principal Investigator.
19. **Chiu, J. L.**, \*Goncz, A., & Lawrence, E. (\$10,000; July 1, 2016 – June 30, 2017). Exploring Engineering Self-Efficacy, Mindset, and Career Interest with Global Design Challenges. Curry Innovative, Developmental, Exploratory Awards (IDEAs), School Faculty Research and Development Fund, University of Virginia. Principal Investigator.
20. Burghardt, D., Fu, X., White, K., & Rhodes, M. (\$2,500,000; September 1, 2014 – August 31, 2019). WISE Guys and Gals – Boys and Girls as WISEngineering STEM Learners. National Science Foundation Division on Learning in Formal and Informal Settings. Consultant.
21. **Chiu, J. L.** (\$40,000; August 15, 2013 - August 14, 2015) Collaborative Research: Scratch that Itch! Democratizing the Teaching of Parallel Computing Concepts. National Science Foundation Division of Advanced CyberInfrastructure. Principal Investigator.
22. **Chiu, J. L.** (\$391,435; October 1, 2011 – September 30, 2014). Collaborative Research: MixedReality Labs: Integrating Sensors and Simulations to Improve Learning. National Science Foundation Cyberlearning: Transforming Education. Principal Investigator.
23. Dexter, S., & Meyer, J. P. (\$1,731,359; August 1, 2011 – July 31, 2014). Strengthening School Leaders' Instructional Leadership Practice Through Developing Teachers' Abilities to Integrate Technology in Support of Student Learning. IES: Education Policy, Finance, Systems, Goal #2: Development. Consultant.
24. Burghardt, D., **Chiu, J. L.**, & Hecht, D. (\$249,453; July 1, 2011 – September 30, 2012). *WISEngineering*—Improving Math Performance through Engineering Design. EDUCAUSE: Next Generation Learning Challenges. Co-Principal Investigator.

25. **Chiu, J. L.**, Bell, R., Murphy, E., & Burton, E. (\$71,408; July 1, 2011 – September 30, 2012). Teaching Scientific Inquiry and the Nature of Science. State Council of Higher Education for Virginia, Improving Teacher Quality State Grants. Principal Investigator.
26. Bell, R., **Chiu, J. L.**, Murphy, E., & Peters-Burton, E. (\$297,923; July 1, 2011 – September 30, 2012). Teaching Scientific Inquiry and the Nature of Science Grades K-5. Virginia Department of Education Mathematics and Science Partnership Competitive Grant Program. Co-Principal Investigator July 2011-June 2012, Principal Investigator July-September 2012.
27. Bull, G., **Chiu, J. L.**, Smolkin, L., & Jones, M. (\$15,000; January 1, 2011 – December 31, 2011). Piloting a Virtual Education Infrastructure for STEM Education. University of Virginia's Commission on the Future of the University Grant. Co-Principal Investigator.
28. **Chiu, J. L.** (\$25,000; August 1, 2009-May 31, 2010). Supporting Students' Knowledge Integration in Technology-Enhanced Inquiry Curricula. Spencer Foundation: Dissertation Fellowship for Research Related to Education.

### CONFERENCE PRESENTATIONS (PEER-REVIEWED)

+ Denotes practitioner collaborator

1. \*Lilly, S., **Chiu, J. L.**, \*Bredder, E., & Crowder, A. (2023, accepted). *A case study of practice-based science enacted in general and inclusive elementary science classrooms: How do teachers provide verbal supports for science and engineering practices?* Annual meeting of the International Society of Learning Sciences, Montreal, CA.
2. Lilly, S., McAlister, A., **Chiu, J. L.** (2023, accepted). *Supporting culturally relevant computer science: Evaluating lesson plans with a research-practitioner partnership rubric.* Annual meeting of the International Society of Learning Sciences, Montreal, CA.
3. \*Lilly, S., McAlister, A., **Chiu, J. L.** (2023, April). *Elementary science teachers' explicit and implicit verbal support of STEM+CS in an NGSS-Aligned Project.* National Association for Research in Science Teaching Annual International Conference, Chicago, IL.
4. Bywater, J., **Chiu, J. L.**, \*Adewole, S., Watson, G., & Brown, D. (2023, April). *Developing an artificial intelligence simulator to support mathematics teacher questioning: The A.I. classroom teaching simulator (ACTS).* Annual meeting of the American Educational Research Association, Chicago, IL.
5. \*Lilly, S., \*Bredder, E., **Chiu, J. L.**, +Austin, C., +Finklin, S., +Mosby, S., Ray Cormier, D., & Crowder, A. (2023, March). *Refining co-designed professional development to support culturally relevant CS in elementary classrooms.* Annual Conference of the ACM Special Interest Group on Computer Science Education (SIGCSE).
6. \*Bredder, E., +Austin, C., **Chiu, J. L.**, +Finklin, S., Lilly, S., +Mosby, S., Ray Cormier, D., & Crowder, A. (2023, March). *Micro-PD: Professional development by teachers in a culturally relevant computer science RPP.* Annual Conference of the ACM Special Interest Group on Computer Science Education (SIGCSE).

7. Bywater, J., **Chiu, J. L.**, \*Lilly, S., \*Datta, D., \*Phillips, M., Watson, G., & Brown, D. (2022, April). *Calibrating an automated rater for use with a validated observational measure of teacher questioning*. Annual meeting of the American Educational Research Association, San Diego, CA.
8. \*Wilkins, K., \*Bredder, E., & **Chiu, J. L.** (2022, April). *Planned use and perceived challenges of equitable computer science teaching strategies with K-8 teachers*. Annual meeting of the American Educational Research Association, San Diego, CA.
9. \*Lilly, S., \*McAlister, A., & **Chiu, J. L.** (2022, April). *Elementary teachers' verbal supports during an NGSS-aligned unit for inclusive and general class contexts*. National Association for Research in Science Teaching Annual International Conference, Vancouver, CA.
10. \*McAlister, A., \*Lilly, S., & **Chiu, J. L.** (2022, April). *How physical science doctoral students involved in educational outreach view and value their educator role*. National Association for Research in Science Teaching Annual International Conference, Vancouver, CA.
11. **Chiu, J. L.**, Crowder, A., Ray Cormier, D., +Mosby, S., & \*Bredder, E. (2022, March). Codesigning learning experiences to support the development of culturally relevant CS lessons in elementary classrooms. SIGSCE 2022: Proceedings of the 53<sup>rd</sup> ACM Technical Symposium on Computer Science Education, 1136. <https://doi.org/10.1145/3478432.3499108>
12. \*Datta, D., \*Phillips, M., Bywater, J. P., **Chiu, J. L.**, Watson, G. S., Barnes, L., & Brown D. E. (2021, Dec). *Evaluation of mathematical questioning strategies using weak supervision*. Paper presented to the Math AI for Education workshop at the Neural Information Processing Systems Conference, Virtual.
13. \*Datta, D., \*Phillips, M., Bywater, J. P., **Chiu, J. L.**, Watson, G. S., Barnes, L., & Brown D. E. (2021, Dec). *Improving mathematical questioning in teacher training*. Paper presented to the Human Centered AI workshop at the Neural Information Processing Systems Conference, Virtual.
14. Basu, S., **Chiu, J.**, McElhaney, K.W., & Biswas, G. (2021, May 10). *SPICE: Science Projects Integrating Computing and Engineering*. \*Winner of Facilitator's Choice Award. <https://stemforall2021.videohall.com/presentations/2142>
15. \*McAlister, A., \*Lilly, S., & **Chiu, J. L.** (2021, April). *A pilot study of science graduate student identity*. Annual meeting of the American Educational Research Association. Virtual conference.
16. Bywater, J., \*Datta, D., \*Phillips, M., Watson, G., \*Lilly, S., Brown, D., & **Chiu, J. L.** (2021, April). *Deep learning approaches to classifying teacher questions within the AI-based classroom simulation (ACTS)*. Annual meeting of the American Educational Research Association. Virtual conference.
17. \*Stenger, K., **Chiu, J. L.**, & Fick, S. (2021, April). *Investigating peer critique and revision of elementary students' conceptual models during an engineering design project*. Annual meeting of the American Educational Research Association. Virtual conference.

18. \*Lilly, S., \*Shepherd, S., & **Chiu, J. L.** (2021, April). *Secondary students' perceptions of collaboration in a formal makerspace*. Annual meeting of the American Educational Research Association. Virtual conference.
19. Fick, S., & **Chiu, J. L.** (2021, April). *Exploring relationships among educative materials and elementary teachers' use of CCCs in NGSS-based instruction*. National Association for Research in Science Teaching Annual International Conference. Virtual conference.
20. \*Lilly, S., \*McAlister, A., Fick, S.J., & **Chiu, J. L.** (2021, April). *Elementary teachers' verbal supports across science, engineering, and computer science disciplines in an NGSS-aligned unit*. National Association for Research in Science Teaching Annual International Conference. Virtual conference.
21. \*McAlister, A., \*Lilly, S., & **Chiu, J. L.** (2021, April). *Physical science doctoral students' perspectives on obstacles and opportunities for identity development in graduate school*. National Association for Research in Science Teaching Annual International Conference. Virtual Conference.
22. \*Wilkins, K., Tychonievich, L., & **Chiu, J. L.** (2021, March). *Changes in K-8 teacher self-efficacy with CS and culturally responsive teaching through an RPP workshop*. The 52nd ACM Technical Symposium on Computer Science Education (SIGCSE). Virtual conference.
23. \*Lilly, S., Fick, S.J., **Chiu, J. L.**, & McElhaney, K.W. (2020, June). *Supporting elementary students to develop mathematical models within design-based integrated science and mathematics projects*. In Proceedings of the 14<sup>th</sup> International Conference of the Learning Sciences. International Society of the Learning Sciences: Nashville, TN.
24. \*Lilly, S., & **Chiu, J. L.** (2020). *Student perceptions of an integrated engineering, computational modeling, and science project*. Annual Meeting of the American Educational Researcher Association, San Francisco, CA. (Conference cancelled)
25. McElhaney, K., Basu, S., McBride, R., **Chiu, J.L.**, & \*McAlister, A. (2020). *Assessing the upper elementary NGSS engineering performance expectations independently of the natural science disciplines*. Annual Meeting of the American Educational Researcher Association, San Francisco, CA. (Conference cancelled)
26. Fick, S., Alozie, N., **Chiu, J. L.**, & McElhaney, K. (2020). *Using the CER framework for supporting idea synthesis in STEM lessons*. Annual Meeting of the American Educational Researcher Association, San Francisco, CA. (Conference cancelled)
27. Fick, S., **Chiu, J.L.**, & McElhaney, K. (2020). *Analysis of elementary preservice and inservice teachers' use of crosscutting concepts in plans and enactments*. National Association for Research in Science Teaching Annual International Conference, Portland, OR. (Conference cancelled)
28. \*Lilly, S., Fick, S., \*McAlister, A., **Chiu, J. L.**, & McElhaney, K. (2020). *Teacher scaffolding to support student learning in an NGSS-aligned unit integrating science and engineering*. National Association for Research in Science Teaching Annual International Conference, Portland, OR. (Conference cancelled)

29. \*Dittrick, C., Fick, S., \*McAlister, A., **Chiu, J. L.**, & McElhaney, K. (2020). *An examination of teacher questioning within science and engineering NGSS-aligned classrooms*. National Association for Research in Science Teaching Annual International Conference, Portland, OR. (Conference cancelled)
30. Bywater, J., **Chiu, J. L.**, & Watson, G. (2019, October). *The teacher responding tool*. Annual Meeting of the Association of Educational Communications and Technology. Las Vegas, NV.
31. McElhaney, K., Biswas, G., & **Chiu, J. L.** (2019, September). *Mathematical complexity of computational modeling experiences for elementary students*. National Science Foundation STEM+C PI Summit Challenges Showcase. Alexandria, VA.
32. \*Rutter, J., \*Barton, E., \*Peddie, F., \*Dion, J., & **Chiu, J. L.** (2019, April). *Supporting preservice teachers' technology integration through design thinking*. Annual Meeting of the American Educational Researcher Association, Toronto, ON.
33. \*Bywater, J., **Chiu, J. L.**, & \*Hong, J. (2019, April). *The Teacher Guidance Tool: Using automated recommendations to support teacher noticing of students' mathematical ideas*. Annual Meeting of the American Educational Research Association, Toronto, ON.
34. **Chiu, J. L.**, McElhaney, K., Zhang, N., Biswas, G., Fried, R., Basu, S., & Alozie, N. (2019, April). *A principled approach to NGSS-aligned curriculum development integrating science, engineering, and computation: A pilot study*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.
35. Fick, S., \*McAlister, A., **Chiu, J. L.**, & McElhaney, K. (2019, April). *Analysis of students' system models in an NGSS-aligned curriculum unit about urban water runoff*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.
36. McElhaney, K.W., Biswas, G., **Chiu, J.L.**, & Harris, C.J. (2018, June). *Aligning next-generation curriculum and assessment design across science, engineering, and computational thinking*. Poster presented at the National Science Foundation DR-K12 & STEM+C Principal Investigators Meeting, Washington, DC.
37. \*Bywater, J., Floryan, M., **Chiu, J. L.**, Chao, J., Schimpf, C., Xie, C., Vieira, C., Magana, A., & Dasgupta, C. (2018, June). *Using machine learning techniques to capture engineering design behaviors*. International Conference of the Learning Sciences, London, UK.
38. **Chiu, J. L.**, \*Bywater, J., & \*Hong, J. (2018, June). *Using a knowledge integration perspective to explore connections among science, mathematics, and engineering modeling practices*. International Conference of the Learning Sciences, London, UK.
39. **Chiu, J. L.**, & Xie, C. (2018, April). *Robert Tinker's legacy: Connecting simulations and probeware with mixed-reality labs*. Annual Meeting of the American Educational Researcher Association, New York, NY.
40. **Chiu, J. L.**, & McElhaney, K. (2018, April). *Using knowledge integration tools to support next generation science standards-aligned science and engineering instruction*. Annual Meeting of the American Educational Researcher Association, New York, NY.

41. \*Ochs, L., **Chiu, J. L.**, & Mumba, F. (2018, March). *Developing preservice science teachers' understanding of engineering design strategies through teaching scenarios*. National Association for Research in Science Teaching Annual International Conference, Atlanta, GA.
42. Mulvey, B., Kulbago, L., Merritt, E., **Chiu, J. L.**, & Bell, R. (2018, March). *Adapting and reflecting: Elementary teachers' and students' NOS explorations associated with a professional development program*. National Association for Research in Science Teaching Annual International Conference, Atlanta, GA.
43. \*Bywater, J., Fu, X., & **Chiu, J. L.** (2017, April). *Assessing the performance of automated short answer scoring to support integrated engineering and science understanding*. Annual Meeting of the American Educational Researcher Association, San Antonio, TX.
44. \*Ochs, L., Mumba, F., & **Chiu, J. L.** (2017, April). *Pre-service teachers' perceptions of engineering and familiarity with teaching design, engineering, and technology*. National Association for Research in Science Teaching Annual International Conference, San Antonio, TX.
45. \*Goncz, A., & **Chiu, J. L.** (2017, April). *Using visualizations to support understanding and application of thermodynamics concepts in middle school engineering design projects*. National Association for Research in Science Teaching Annual International Conference, San Antonio, TX.
46. \*Ochs, L., Mumba, F., **Chiu, J. L.**, & Rutt, A. (2017, January). *Pre-service teachers' self-efficacy of teaching engineering in science classrooms*. Association for Science Teacher Education International Conference, Des Moines, IA.
47. Chabalengula, V., \*Bendjemil, S., Mumba, F., & **Chiu, J. L.** (2017, January). *Status of science and engineering practices in K-12 science curriculum materials*. Association for Science Teacher Education International Conference, Des Moines, IA.
48. **Chiu, J. L.** (2016, June). *WISEngineering: Scaffolding engineering design*. Perspectives on Solution Diversity and Divergent Thinking in K-12 Engineering Design Learning Experiences. National Science Foundation DRK-12 PI Meeting, Washington, D.C.
49. **Chiu, J. L.** (2016, June). *WISEngineering: Supporting precollege engineering design*. Scalable Tools Roundtable Session. Cyberlearning 2016, Arlington, VA.
50. **Chiu, J. L.** (2016, April). *Correlating student drawings and texts to assess understanding of the particle model of matter*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.
51. \*Rates, C., Mulvey, B., & **Chiu, J.** (2016, April). *Teaching complex systems components with an agent-based participatory simulation*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.
52. Mumba, F., & **Chiu, J. L.** (2016, April). *A design charrette to explore models for engaging science preservice teachers in engineering*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.

53. \*Whitworth, B., Maeng, J., \*Wheeler, L., & **Chiu, J. L.** (2016, April). *A foundational study of the district science coordinators role in supporting science instruction*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.
54. \*Wheeler, L., Maeng, J., **Chiu, J. L.**, & Bell, R. (2016, April). *Do teaching assistants matter? Assessment of teaching assistants' impact on student outcomes in a general chemistry laboratory*. National Association for Research in Science Teaching Annual International Conference, Baltimore, MD.
55. \*Whitworth, B., Maeng, J., & **Chiu, J. L.** (2016, April). *Investigating the roles and responsibilities of district science coordinators*. Annual Meeting of the American Educational Researcher Association, Washington, D.C.
56. **Chiu, J. L.** (2016, April). *Exploring how mixed-reality technologies can help students understand gas phenomena through drawing and explanation tasks*. Annual Meeting of the American Educational Researcher Association, Washington, D.C.
57. \*Rates, C., Mulvey, B., & **Chiu, J. L.** (2016, April). *Scaffolding an agent-based participatory simulation to teach complex systems components*. Annual Meeting of the American Educational Researcher Association, Washington, D.C.
58. \*Gonczi, A., **Chiu, J. L.**, & Maeng, J. (2016, April). *Science teachers' computer simulation use to support engineering design*. Annual Meeting of the American Educational Researcher Association, Washington, D.C.
59. Wheeler, L.B., Chiu, J.L., Maeng, J.L., & Bell, R.L. (2016, January). *Inquiry-based professional development for general chemistry laboratory teaching assistants: Changes in teaching assistants' knowledge, beliefs and confidence*. A paper for the Annual Meeting of the Association for Science Teacher Education, Reno, NV.
60. **Chiu, J. L.** (2015, April). *Exploring how middle school students monitor and regulate their understanding of science and engineering concepts during engineering design projects*. Annual Meeting of the American Educational Researcher Association, Chicago, IL.
61. \*DeJaegher, C., **Chiu, J. L.**, & \*Chao, J. (2015, April). *Sensor augmented virtual laboratories: Investigating the impact of user interface on student learning in secondary science*. Annual Meeting of the American Educational Researcher Association, Chicago, IL.
62. \*Chao, J., **Chiu, J. L.**, & \*DeJaegher, C. J. (2015, April). *Effects of user interface on simulationbased science learning: Tangible user interface versus graphical user interface*. Annual Meeting of the American Educational Research Association. Chicago, IL.
63. \*Mulvey, B., Kulbago, L., Bell, R., & **Chiu, J. L.** (2015, April). *Elementary teachers' first attempts to learn about and teach the NOS*. National Association for Research in Science Teaching Annual International Conference, Chicago, IL.
64. \*Whitworth, B., \*Wheeler, L., & **Chiu, J. L.** (2015, January). *Critical factors impacting the role of a district science coordinator*. Annual Meeting of the Association for Science Teacher Education, Portland, OR.



65. \*DeJaegher, C., **Chiu, J. L.**, & \*Chao, J. (2014, June). *Design principles for science laboratory instruction using augmented virtuality technologies*. Proceedings of the 11th International Conference of the Learning Sciences-Volume 3, Boulder, CO.
66. \*Pan, E., **Chiu, J. L.**, Inkelas, K., Russell, S., & Berger, E. (2014, April). *Physical and virtual manipulatives in mechanical engineering education*. Annual Meeting of the American Educational Research Association, Philadelphia, PA.
67. \*Chao, J., **Chiu, J. L.**, \*Pan, E., \*DeJaegher, C., Hazzard, E., & Xie, C. (2014, April). *The effects of mixed-reality laboratories on high school students' conceptual understanding of gas laws*. Annual Meeting of the American Educational Research Association, Philadelphia, PA.
68. \*Merritt, E., **Chiu, J. L.**, Peters-Burton, E., & Bell, R. (2014, April). *Young children doing science: The use of scientific practices in kindergarten and first-grade classrooms*. Annual Meeting of the American Educational Research Association, Philadelphia, PA.
69. Ghosh, R., \*Mulvey, B., **Chiu, J. L.**, & Bell, R. (2014, January). *Elementary SPED teachers' initial science inquiry and NOS teaching experiences*. Annual Meeting of the Association for Science Teacher Education, San Antonio, TX.
70. \*Pan, E., & **Chiu, J. L.** (2013, April). *Comparing judgments of learning in visualization-based and text-based chemistry instruction*. Annual Meeting of the American Educational Research Association, San Francisco, CA.
71. \*Chao, J., **Chiu, J. L.**, Hazzard, E., & Xie, C. (2013, April). *Effects of mixed-reality labs on students' conceptual understanding, cognitive load and epistemology of science*. Annual Meeting of the American Educational Research Association, San Francisco, CA.
72. McElhaney, K., Chang, H., **Chiu, J. L.**, & Linn, M. C. (2013, April). *Meta-analysis of the benefits of dynamic and static visualizations for science learning*. Annual Meeting of the American Educational Research Association, San Francisco, CA.
73. \*Mulvey, B., Peters-Burton, E., & **Chiu, J. L.** (2013, January). *Baby steps: Elementary teachers' Initial, concurrent NOS learning and teaching*. International Conference of the Association for Science Teacher Education, Charleston, SC.
74. **Chiu, J. L.** (2012, July). *Student self-assessment of knowledge integration in a technology-enhanced chemistry lesson*. International Conference of the Learning Sciences, Sydney, Australia.
75. \*DeJaegher, C., & **Chiu, J. L.** (2012, March). *WISEngineering: engaging students in STEM through engineering design*. Annual Meeting of the National Science Teachers Association, Indianapolis, IN.
76. \*DeJaegher, C., & **Chiu, J. L.** (2011, November). *An overview of WISEngineering*. Annual meeting of the Association for Educational Communications & Technology, Jacksonville, FL.
77. **Chiu, J. L.** (2011, June). *Investigating the role of collaboration on monitoring understanding with dynamic visualizations*. International Conference on Computer-Supported Collaborative Learning, Hong Kong, China.

78. **Chiu, J. L.** (2011, June). *Collaborative Learning with Scaffolded Dynamic Visualizations*. In Spada, H., Stahl, G., Miyake, N., Law, N. (Eds.) *Connecting Computer-Supported Collaborative Learning to Policy and Practice: CSCL2011 Conference Proceedings. Volume II — Short Papers & Posters*. International Society of the Learning Sciences, Inc.
79. **Chiu, J. L.** (2010, June). *Developing students' criteria for visualizations by prompting judgments of fidelity*. International Conference of the Learning Sciences, Chicago, IL.
80. White, B., **Chiu, J. L.**, Barth-Cohen, L., Schwendimann, B., Berson, E., Chen, J. K., & Swanson, H. (2010, June). *Towards a taxonomy of explanations in science education*. Proceedings of the 9th International Conference of the Learning Sciences-Volume 2, 493-495.
81. **Chiu, J. L.** (2010, April). *Prompting explanations: The impact of specificity on learning with dynamic visualizations*. Annual Meeting of the American Educational Research Association, Denver, CO.
82. **Chiu, J. L.** (2009, April). *The impact of feedback on student learning and monitoring with dynamic visualizations*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.
83. **Chiu, J. L.**, & Linn, M. C. (2008, June). *Self-assessment and self-explanation for learning chemistry using dynamic molecular visualizations*. In *International Perspectives in the Learning Sciences: Creating a Learning World. Proceedings of the 8th International Conference of the Learning Sciences* (Vol. 3, pp. 16-17). Utrecht, The Netherlands: International Society of the Learning Sciences, Inc.
84. Linn, M. C., Chang, H.-Y., **Chiu, J. L.**, & Zhang, Z. (2007, August). *Visualization and science learning*. Biannual Meeting of the European Association for Research on Learning and Instruction, Budapest, Hungary.
85. **Chiu, J. L.** (2007, April). *Eliciting explanations and self-assessments to support students' knowledge integration*. Annual Meeting of the American Educational Research Association, Chicago, IL.
86. **Chiu, J. L.** (2007, April). *Supporting students' integration of chemical representations with dynamic visualizations*. Annual Meeting of the American Educational Research Association, Chicago, IL.
87. **Chiu, J. L.**, & Linn, M. C. (2007, February). *Visualizing chemistry: How do students benefit?* Annual Meeting of the American Association for the Advancement of Science, San Francisco, CA.
88. **Chiu, J. L.** (2006, April). *Using dynamic visualizations and embedded prompts for integrated understandings of chemical reactions*. Annual Meeting of the American Educational Research Association, San Francisco, California.
89. **Chiu, J. L.** (2005, April). *Enhancing chemistry understanding through interactive models and embedded prompts*. Poster presented at the Annual Meeting of the American Educational Research Association, Montreal, Quebec.

### ***Scholarly Workshops***

1. Chang, H., Shen, J., Varma, K., & **Chiu, J. L.** (2011, July). *Designing digital curricula and visualizations in the New WISE environment to facilitate collaborative science learning.* Workshop as part of the 9th International Conference Computer-Supported Collaborative Learning, Hong Kong.

### ***Invited Presentations***

1. **Chiu, J. L.** (2022, April). *Developing the AI-based classroom teaching simulator.* In the Division K invited session: Simulations as a tool for preparing teachers to engage in equitable instruction. Annual meeting of the American Educational Research Association, San Diego, CA.
2. **Chiu, J. L.** (2021, February). *Supporting computational thinking and engineering in elementary science classrooms.* Stanford University Science Education Seminar.
3. **Chiu, J. L.** (2020, May). *Applying for grant funding webinar.* NSF DRK12 Community for Advancing Discovery Research in Education (CADRE).
4. **Chiu, J. L.** (2019, August). *Integrating engineering into mathematics and science.* Catedra Global, Universidad del Norte, Barranquilla, Colombia.
5. **Chiu, J. L.** (2019, August). *How engineering can be used to integrate science and mathematics.* II Foro International STEM+H, Medellin, Colombia.
6. **Chiu, J. L.** (2016, February). *Can we enhance our curriculum with cyberlearning resources?* National Science Foundation STEM Smart Workshop. San Francisco, CA.
7. **Chiu, J. L.** (2015, April). *Physical and virtual manipulatives in engineering education.* University of Virginia American Society for Engineering Education and Graduate Engineering Student Council Seminar Series. Charlottesville, VA.
8. **Chiu, J. L.** (2012, September). *WISEngineering.* University of Virginia Department of Mechanical and Aerospace Engineering. Charlottesville, VA.

## **TEACHING**

### **COURSES TAUGHT**

#### ***University of Virginia***

EDIS 3452: Designing Games for Learning (Fall 2016, 2017, 2018, 2019, 2020, 2021; Spring 2021)

EDIS 5010: Teaching Secondary Science (Fall 2010, 2011, 2012)

EDIS 5011: Teaching Secondary Science II (Spring 2011)

EDIS 5070: Designing Technology-Enhanced Instruction (Fall 2018, 2019, 2020, 2021, 2022; Spring 2017, 2018, 2019, 2020)

EDIS 9450: Readings and Research in Mathematics Education – Probabilistic and Statistical Reasoning (Spring 2011)

EDIS 5500: Instructional Visualizations (Fall 2011, 2012)

EDIS 5500: Educational Apps, Simulations, and Videogames (Spring 2012, 2013, 2014)

EDIS 7075: Applying Learning Theories in STEM Education (Fall 2015, 2016, 2017; Spring 2020, 2022)

EDIS 8500: Development of STEM Expertise (Fall 2014)

PSED 6507-551, PSED 6507-552: Teaching the Nature of Science and Scientific Inquiry (course required for all Charlottesville City Schools in-service elementary school teachers, Fall 2011; 2012)

EDIS 5500-551, EDIS 5500-552: Teaching the Nature of Science and Scientific Inquiry (course required for all Charlottesville City Schools in-service elementary school teachers, Fall 2012)

#### *Online Courses*

EDIS 7010: Courseware Tools (Fall 2015)

#### ***University of California, Berkeley***

The Nature of Scientific Explanations (Fall 2010; Spring 2011, cotaught with Barbara White)

### **ADVISING**

#### **Postdoctoral Fellows/Research Faculty Advised**

1. Emily Barton, University of Virginia/Jefferson Exchange
2. Jie Chao, Concord Consortium
3. Sarah Fick, Washington State University
4. Amanda Gonczi, Michigan Technological University
5. Sarah Lilly, University of Virginia
6. Eileen Merritt (with Sara Rimm-Kaufman), Virginia Tech
7. Edward Pan, Amazon Web Services
8. Kim Wilkens, University of Virginia

#### **Ph.D./Ed.D. students**

##### *Graduated (Chair or Co-chair)*

1. William Alexander, co-chair with Randy Bell, Science Education, USPTO
2. James Bywater, chair, James Madison University
3. Debajyoti Datta, Co-chair with Don Brown, Systems Engineering, School of Engineering
4. Crystal DeJaegher, chair, University of Notre Dame
5. Amy Germundson, co-chair with Carol Tomlinson, Independent Consultant
6. Amanda Gonczi, co-chair with Randy Bell, Michigan Technological University
7. Gabrielle Griffin, Instructional Technology, University of Virginia
8. Bert Jacoby, co-chair with Susan Mintz, Instructional Technology
9. Raina Kim, chair, Instructional Technology
10. Sarah Lilly, chair, University of Virginia
11. Anne McAlister, STEM Education, University at Buffalo
12. Eddie Pan, chair, Amazon Web Services
13. Chris Rates, chair, University at Buffalo, State University of New York
14. Lindsay Wheeler, co-chair with Randy Bell, University of Virginia
15. Kim Wilkens, Computer Science Education, University of Virginia
16. Brooke Whitworth, co-chair with Randy Bell, Clemson University
14. Kari Wold, co-chair with Stephanie Moore, University of Kentucky
15. Eric Yoder, co-chair with Stephanie Moore, Instructional Technology

### *Current doctoral advisees*

1. Eric Bredder, STEM Education
2. Sara Amato, Instructional Technology
3. Michael Cuellar, Instructional Technology
4. Christina Erland, Instructional Technology
5. Erica Ford, Instructional Technology
6. Michelle Spotts, Instructional Technology
7. Allyson Wharam, Instructional Technology

### *Dissertation Committee Member*

1. Christianna Andrews, Instructional Technology
2. Emily Barton, Instructional Technology
3. Ksenia Brazhnik, Department of Environmental Science
4. Jennifer Campbell, Engineering Systems and Environment, School of Engineering
5. Devasmita Chakraverty, Science Education
6. Katherine Dabney, Science Education
7. Christopher Dittrick, Curriculum & Instruction
8. Lily Edmon, Science Education
9. Michael Gurlea, Curriculum & Instruction
10. Ashley Hunt, Educational Psychology-Applied Developmental Science
11. Monty Jones, Instructional Technology
12. Xiaoqing Kong, Science Education
13. Lisa Lampe, Higher Education
14. Peter Malcolm, Instructional Technology
15. Eileen Merritt, Educational Psychology-Applied Developmental Science
16. Bridget Mulvey, Science Education
17. Jesse Pappas, Social Psychology, Department of Psychology
18. James Rutter, Instructional Technology
19. Angela Skeeles-Worley, Science Education
20. Katelyn Stenger, Engineering Systems and Environment, School of Engineering
21. Barbara Swartz, Mathematics Education
22. Daniel Tillman, Instructional Technology
23. Caner Uguz, Instructional Technology
24. Victoria VanUitert, Special Education
25. Beverly Wood, Mathematics Education
26. Ningyu Zhang, Systems Engineering, Vanderbilt University

## **D. SERVICE**

### **Editorial Boards**

- Associate Editor, American Educational Research Journal (2022-present)
- Associate Editor, Journal of Engineering Education (2021-present)
- Associate Editor, Journal of Pre-College Engineering Education Research (2022-present)
- Associate Editor, Science Educator (2019-2021)

## National Advisor/Advisory Board

- Community Tech Press: Sixth-grade youth expanding engineering through critical multilingual journalism. National Science Foundation Grant, PI: Greses Perez. Advisory Board Member (2023-present)
- Computational Modeling for Integrating Science and Engineering Design: Model Construction, Manipulation, and Exploration. National Science Foundation Grant, PI: Satabdi Basu. Advisory Board Member (2022-present)
- Center for STEM Education, Notre Dame University. Advisory Board Member (2018-present)
- Digital Technology Integration and Engineering Contexts to Support Elementary Students' Systems Thinking. National Science Foundation Grant, PI: Jennifer Maeng. Advisory Board Member (2019-2023)
- Exploring Computation Integrated into Technology and Engineering. National Science Foundation, PI: Anthony Gordon. Advisory Board Member (2019-2023)
- Graphing Research on Inquiry with Data in Science (GRIDS), National Science Foundation, PI: Marcia Linn. Advisory Board Member (2017-2021)
- Jefferson Education Exchange. Educational Research Advisor (2018-2022).

## Organizational Memberships

- American Educational Research Association Member and Annual Meeting Reviewer
- National Association of Research in Science Teaching
- International Conference of the Learning Sciences Member and Meeting Reviewer
- American Society for Engineering Education, K12 and Precollege Diversity Committee
- 100kin10, University of Virginia representative

## Service-oriented Presentations and Workshops

- \*Wilkins, K., & **Chiu, J. L.** (2021, December). Creating equitable computer science experiences: What works? Virginia Society for Technology in Education, Roanoke, VA.
- D'Alessio, M., McElhaney, M., Basu, S., **Chiu, J. L.**, Biswas, G. (2021, October). *My schoolyard flooded! Engineering and computational modeling of Earth systems*. California Science Education Experience. Virtual conference.
- **Chiu, J. L.**, \*Wilkins, K., Standish, N., & Tychonievich, L. (2021, July). *Creating equitable computer science experiences*. Professional Development Workshop for Charlottesville City Schools. Virtual conference.
- \*Wilkins, K., **Chiu, J. L.**, Standish, N., & Tychonievich, L. (2021, July). *Computer science institute*. Professional Development Workshop. Virtual conference.
- \*Wilkins, K. & **Chiu, J. L.** (2021, July). *Creating equitable computer science experiences*. Computer Science Teacher Association. Virtual conference.
- Crowder, A., **Chiu, J. L.**, Ray Cormier, D., \*Bredder, E. (2021, June). *Computer science for and by teachers: An integrative toolkit for elementary classrooms*. Research-Practitioner Partnership Workshop. Virtual conference.
- \*Wilkins, K. & **Chiu, J. L.** (2020, December). *Creating equitable computer science experiences*. Virginia Society for Technology in Education. Virtual conference.

- **Chiu, J. L.**, Wilkens, K., Standish, N., & Tychonievich, L. (2020, July). *Creating equitable computer science experiences*. Professional Development Workshop for Charlottesville City Schools. Virtual conference.
- Wilkens, K., **Chiu, J. L.**, Standish, N., & Tychonievich, L. (2020, July). *Computer science institute*. Professional Development Workshop. Virtual conference.
- **Chiu, J. L.**, Fick, S., \*Lilly, S., & \*McAlister, A. (2019, November). *Research in STEM education*. Society for Women Engineers, Charlottesville, VA.
- **Chiu, J. L.** (2019, November). *Careers in STEM education*. High School Visitation Day, Society for Women Engineers, Charlottesville, VA.
- Cleckley, E. & **Chiu, J. L.** (2018, April; 2017, May). *Design thinking in education*. Professional development workshop, Albemarle County Public Schools, Charlottesville, VA.
- **Chiu, J. L.** (2017, November). *Designing simulations to support STEM education*. Curry Family Weekend Presentation. Charlottesville, VA.
- **Chiu, J. L.** (2017, November). *What is engineering?* Woodbrook Elementary School, Charlottesville, VA.
- **Chiu, J. L.** (2017, September). *Teaching engineering design*. ISTEM Professional Development workshop. Charlottesville City Schools, Charlottesville, VA.
- **Chiu, J. L.** (2017, April). *Educational technology: Empowering access to transformative learning*. Future of Learning Forum, Charlottesville, VA.
- **Chiu, J. L.** (2016, June). *WISEngineering design*. ISTEM Professional Development workshop, Charlottesville City Schools, Charlottesville, VA.
- **Chiu, J. L.** (2016, February). *Innovation in education*. Darden School of Business Black Business School Student Foundation. Charlottesville, VA.
- **Chiu, J. L.** (2016, February). *Design thinking in education*. University of Virginia Systems Engineering Design seminar. Charlottesville, VA.
- Richards, L., **Chiu, J. L.**, & Donohue, S. (2016, February). *Engineering design with engineering tool kits*. Professional Development workshop, Albemarle Public Schools, Charlottesville, VA.
- **Chiu, J. L.** (2015, June). *STEM education*. NSF Center for Chemistry of the Universe and Louis Stokes Alliance for Minority Participation (LSAMP) Program, Charlottesville, VA
- **Chiu, J. L.** (2014, June). *STEM education*. NSF Center for Chemistry of the Universe and Louis Stokes Alliance for Minority Participation (LSAMP) Program, Charlottesville, VA
- **Chiu, J. L.**, Richards, L., & Donohue, S. (2012, April). *Engineering design with engineering tool kits*. Professional Development workshop, Albemarle Public Schools, Charlottesville, VA.
- **Chiu, J. L.** (2011, June). *STEM education*. NSF Center for Chemistry of the Universe and Louis Stokes Alliance for Minority Participation (LSAMP) Program, Charlottesville, VA
- **Chiu, J. L.**, Bell, R., & Murphy, E. (2011, July). *Teaching the nature of science and scientific inquiry (6-8)*. Virginia State Public Schools. Charlottesville, VA.
- **Chiu, J. L.**, Maeng, J., & Mulvey, B. (2010, November). *Teaching the nature of science and scientific inquiry*, Professional Development workshop, Frederick County Public Schools, Winchester, VA.

## **Federal Reviewer**

- National Science Foundation, Education and Human Resources (2011-present)
- National Science Foundation, Computer and Information Science and Engineering (2011-present)
- National Science Foundation, Faculty Early Career Development (CAREER) Program (2014-present)

## **University of Virginia Service**

- Center for Innovation in Computing Education and Outreach Steering Committee (2019-2021)
- UVA Committee on Sustainability Faculty Representative (2020-2021)
- Center for Teaching Excellence Pedagogy Summit Advisory Board member (2019-2021)
- International Residence College Faculty Fellow (2019-present)
- American Society for Engineering Education UVA Chapter Faculty Sponsor (2012-2016)
- National Science Teachers Association Student Chapter Faculty Sponsor (2010-2012)
- School of Education-School of Engineering and Applied Science Engineering Education Speaker Committee (2011)
- Office of African-American Affairs Faculty Mentor (2011)
- Pan-University Institutes:
  - Convergent Behavioral Science Institute, Affiliated Faculty
  - Resilience Institute, led by Karen McGlathery, Affiliated Faculty
- Search Committee Member:
  - Director of Science Education and Public Outreach, College of Arts and Sciences, Office of the Dean (2011-2012)
  - Assistant Professor of Mechanical and Aerospace Engineering, School of Engineering and Applied Science (2012-2013)
  - Modeling and Simulation, School of Engineering and Applied Science (2017-2018, 2018-2019)
- Program Development
  - Co-led development of a new joint BS in engineering/Masters of Teaching five-year program with Linda Boone, Susan Bagby and James Groves from the School of Engineering and Applied Sciences (2013-2015)

## **School of Education Service**

- Faculty Council Chair (2022-2023)
- Instructional Technology, Non-Tenure Track Assistant Professor Search Committee, Chair (2022-2023)
- Ad-hoc Committee on Annual Review Processes (2022-present)
- Faculty Council Chair-Elect (2021-2022)
- Budget Committee CISE Representative (2020-present)
- Youth and Social Innovation Affiliated Faculty (2017-present)
- Design Initiative lead (2016-present)
- Ad Hoc Task Force on Faculty Review and Feedback Procedures Committee (2020-2021)
- School of Education Foundation Faculty Representative (2017-2020)
- Faculty Council CISE Department Representative (2018-2020)
- Search Committee Member:



- Dean, Education and Human Development (2021-2022)
- Instructional Technology, Department of Curriculum, Instruction, and Special Education (2021-2022)
- Research Assistant Professor, Department of Curriculum, Instruction, and Special Education (2021)
- Director of Simulation, Department of Curriculum, Instruction, and Special Education (2021)
- Mellon Postdoctoral Fellow (2021)
- Simulation, Department of Curriculum, Instruction, and Special Education (2016-2017)
- Educational Psychology/Applied Developmental Science Assistant Professor, Department of Leadership, Foundations & Policy (2015-2016)
- Nutrition Assistant/Associate Professor, Department of Kinesiology (2015-2016)
- STEM Education Open Rank Professor, Department of Curriculum, Instruction, and Special Education (2012-2013)
- Teacher Education Administrative Manager, Department of Curriculum, Instruction, and Special Education (2011-2012)
- ADHD/Youth-Nex Assistant Professor, Department of Human Services (2012)
- Promotions and Tenure, Internal Review Committee Member (2018-2019; 2019-2020)
- Graduation Committee (2010, 2011)
- STEM Education Research Brown Bag Seminars Lead (2010, 2015, 2019)

#### **Department of Curriculum Instruction and Special Education**

- Science Education Program Admissions – Applicant Reviewer (2010-present)
- Instructional Technology Program Admissions - Applicant Reviewer, (2010-present)
- Student Travel Awards Committee (2011-2012)

#### **E. HONORS**

2023	Finalist for Charlottesville Business Innovation Council Partnership of the Year ( <i>Buford Lab School</i> )
2023	Finalist for Charlottesville Business Innovation Council Partnership of the Year ( <i>Charlottesville Computer Science Collaborative</i> )
2020	Finalist for Charlottesville Business Innovation Council Partnership of the Year ( <i>Charlottesville Computer Science Collaborative</i> )
2013	National Science Foundation Faculty Early Career Award
2012	International Conference of the Learning Sciences Early Career Fellow
2009	Spencer Foundation Dissertation Fellow for Research Related to Education
2008	International Conference of the Learning Sciences Doctoral Consortium Fellow
2007	Outstanding Graduate Student Instructor, U.C. Berkeley Spencer Research Training Fellow, U.C. Berkeley