

JENNIFER L. CHIU

Department of Curriculum, Instruction, and Special Education

Associate Professor, School of Education and Human Development, University of Virginia

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

2017-present Associate Professor, Curry School of Education, University of Virginia

2010-present Assistant Professor, Curry School of Education, 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

PUBLICATIONS (*designates advisee/postdoctoral fellow)

1. Zhang, N., Biswas, G., McElhaney, K., Basu, S., McBride, E., **Chiu, J. L.** (2020). Studying the Interactions between Science, Engineering, and Computational Thinking in a Learning-by-Modeling Environment. *Proceedings of the International Conference on Artificial Intelligence in Education*. Springer, Cham.
2. 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. In *Proceedings of the 14th International Conference of the Learning Sciences*. International Society of the Learning Sciences: Nashville, TN.
3. *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. In *Proceedings of the American Society for Engineering Education*.
4. Barton, E., Brown, D., & **Chiu, J. L.** (2020). Tracking Down the Secret Sauce for Empowering Students with Technology. *Educational Leadership*, 77(6), 72-77.
5. *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.
6. *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.

7. 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.
8. 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.
9. 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.
10. 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.
11. *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.
12. **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.
13. **Chiu, J. L.** (2017). Community Technology Centers. In K. Peppler (Ed.), *Encyclopedia of Out-of-School Learning* (pp. 110). Thousand Oaks, CA: Sage.
14. **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.
15. 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.
16. *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.
17. *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.
18. *Gonczi, A., **Chiu, J. L.**, & *Pan, E. (2016). WISEngineering hydroponics: A technology-enhanced life science engineering design unit. *Science Scope*, 39(9), 19-25.
19. *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.
20. *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.
21. *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.
22. *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.
23. **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.

24. *Whitworth, B., & **Chiu, J. L.** (2015). Professional development and teacher change: The missing leadership link. *Journal of Science Teacher Education*, 26(2), 121-137.
25. 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.
26. **Chiu, J. L.** (2015). Scientific Visualizations. In R. Gunstone (Ed.), *Encyclopedia of Science Education* (pp. 951-955). New York: Springer Reference.
27. **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.
28. Fu, X., Befferman, T., **Chiu, J. L.**, & Burghardt, M. (2015). WISEngineering: Achieving scalability and extensibility in massive online learning. *Proceedings of the 16th International Conference on Web Information System Engineering*, Miami, FL.
29. **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.
30. **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>
31. 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.
32. *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.
33. *Whitworth, B., **Chiu, J. L.**, & Bell, R. (2014). Kinesthetic investigations in the physics classroom. *The Physics Teacher*, 52(2), 91-93.
34. *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.
35. **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.
36. *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.
37. **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.
38. **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. Alevon (Eds.), *International Handbook of Metacognition and Learning Technologies* (pp. 517-531). New York: Springer.
39. 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.

40. 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.
41. *Dejaegher, C., **Chiu, J. L.**, Burghardt, M. D., Hecht, D., *Malcolm, P., & *Pan, E. (2012). Learning Common Core Math Concepts with WISEngineering. *Proceedings of the Annual Conference of the American Society for Engineering Education*, San Antonio, TX.
42. *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.
43. **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.
44. Linn, M.C., & **Chiu, J. L.** (2011). Combined learning and assessment to improve science education. *Research and Practice in Assessment*, 5, 5-13.
45. **Chiu, J. L.**, & Linn, M. C. (2011). Knowledge integration and WISE engineering. *Journal of Pre-college Engineering Education Research*, 1(1), 1-14.
46. 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.
47. 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.
48. 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.
49. 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.

GRANTS

Funded Grants

1. 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 3rd-5th Grade Classrooms. Co-Principal Investigator.
2. Kennedy, M., **Chiu, J. L.** (\$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.
3. Pianta, R., **Chiu, J. L.**, Watson, G., & Brown, D. (\$369,884; June 1, 2020 – May 31, 2023). AI Classroom Simulation for Teacher Preparation. Robertson Foundation. Co-Principal Investigator.
4. **Chiu, J. L.**, Cleckley, E., Saunders, S. (\$38,437; May 1, 2020 – May 31, 2021) Creating Educational Citizen-Leaders through Service Learning. The Jefferson Trust. Principal Investigator.

5. Standish, N., **Chiu, J.L.**, Tychonievich, L. (\$124,000; January 1, 2020 – December 31, 2020). Creating Equitable and Integrated Computer Science Experiences for All Students. Virginia Department of Education. Co-Principal Investigator.
6. McElhaney, K., **Chiu, J. L.**, Biswas, G., & Harris, C. (\$2,699,962; September 1, 2017 - August 1, 2021). 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.
7. **Chiu, J. L.**, Wheelock, M. (\$199,690; July 1, 2017 – June 30, 2019). Educational Design Initiative. University of Virginia Curry Innovation Funds. Principal Investigator.
8. **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.
9. **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.
10. Mumba, F., **Chiu, J. L.**, Bailey, R., & Hoon, J. (\$325,000; August 1, 2016 – July 31, 2019). 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.
11. Mumba, F., **Chiu, J. L.**, Tai, R., Richards, L., & Chabalengula, V. (\$1,284,321; August 1, 2014 - July 31, 2019). University of Virginia Robert Noyce Scholarship Program. National Science Foundation Division of Undergraduate Education. Co-Principal Investigator.
12. **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.
13. **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.
14. 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.
15. **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.
16. **Chiu, J. L.** (\$391,435; October 1, 2011 – September 30, 2014). Collaborative Research: Mixed-Reality Labs: Integrating Sensors and Simulations to Improve Learning. National Science Foundation Cyberlearning: Transforming Education. Principal Investigator. Collaborative grant with Xie, C., & Hazzard, E. (\$1,350,000 collaboratively).
17. 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.
18. 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.

19. **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.
20. Bell, R., **Chiu, J. L.**, Murphy, E., & 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.
21. 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.
22. **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.

PRESENTATIONS

1. *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 14th International Conference of the Learning Sciences. International Society of the Learning Sciences: Nashville, TN.
2. *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)
3. 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)
4. 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)
5. 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)
6. *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)
7. *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)
8. 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.
9. Bywater, J., **Chiu, J. L.**, Watson, G. (2019, October). Assessing the Effectiveness of an Intelligent Tool that Supports Targeted Teacher Responses to Student Ideas. Annual Meeting of the Association of Educational Communications and Technology. Las Vegas, NV.

10. 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.
11. *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.
12. *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.
13. **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.
14. 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.
15. 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.
16. 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.
17. **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.
18. **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.
19. **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.
20. 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.
21. 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.
22. *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.
23. *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.
24. *Gonczi, 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.

25. *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.
26. 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.
27. **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.
28. **Chiu, J. L.** (2016, June). *WISEngineering: Supporting precollege engineering design*. Scalable Tools Roundtable Session. Cyberlearning 2016, Arlington, VA.
29. **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.
30. *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.
31. 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.
32. *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.
33. *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.
34. *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.
35. **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.
36. *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.
37. *Goncz, 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.
38. **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.
39. *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.
40. *Chao, J., **Chiu, J. L.**, & *DeJaegher, C. J. (2015, April). *Effects of user interface on simulation-*

- based science learning: Tangible user interface versus graphical user interface.* Annual Meeting of the American Educational Research Association. Chicago, IL.
41. *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.
 42. *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.
 43. *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.
 44. *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.
 45. *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.
 46. *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.
 47. 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.
 48. *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.
 49. *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.
 50. 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.
 51. *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.
 52. 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.
 53. *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.
 54. *DeJaegher, C., & **Chiu, J. L.** (2011, November). *An overview of WISEngineering.* Annual meeting of the Association for Educational Communications & Technology, Jacksonville, FL.
 55. **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.
 56. **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.

57. **Chiu, J. L.** (2010, June). *Developing students' criteria for visualizations by prompting judgments of fidelity.* International Conference of the Learning Sciences, Chicago, IL.
58. 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.
59. **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.
60. **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.
61. **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.
62. 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.
63. **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.
64. **Chiu, J. L.** (2007, April). *Supporting students' integration of chemical representations with dynamic visualizations.* Annual Meeting of the American Educational Research Association, Chicago, IL.
65. **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.
66. **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.
67. **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. Cleckley, E. & **Chiu, J. L.** (2018, April; 2017, May). *Design thinking in Education.* Professional development workshop, Albemarle County Public Schools, Charlottesville, VA.
2. 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.** (2019, August). Integrating engineering into mathematics and science. Catedra Global, Uninorte University, Barranquilla, Colombia.
2. **Chiu, J. L.** (2019, August). How engineering can be used to integrate science and mathematics. Il Foro International STEM+H, Medellin, Colombia.
3. **Chiu, J. L.** (2016, February). *Can we enhance our curriculum with cyberlearning resources?* National Science Foundation STEM Smart Workshop. San Francisco, CA.
4. **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.
5. **Chiu, J. L.** (2012, September). *WISEngineering.* University of Virginia Department of Mechanical and Aerospace Engineering. Charlottesville, VA.

C. TEACHING

COURSES TAUGHT

University of Virginia

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

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; 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)

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. Sarah Fick, Washington State University
3. Amanda Gonczi, Michigan Technological University
4. Jie Chao, Concord Consortium
5. Eileen Merritt (with Sara Rimm-Kaufman), Assistant Professor at Arizona State University

6. Edward Pan, Amazon Web Services

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. Crystal DeJaegher, chair, University of Notre Dame
4. Amy Germundson, co-chair with Carol Tomlinson, Independent Consultant
5. Amanda Gonczi, co-chair with Randy Bell, Michigan Technological University
6. Bert Jacoby, co-chair with Susan Mintz, Instructional Technology
7. Raina Kim, chair, Instructional Technology
8. Eddie Pan, chair, Amazon Web Services
9. Chris Rates, chair, University at Buffalo, State University of New York
10. Lindsay Wheeler, co-chair with Randy Bell, University of Virginia
11. Brooke Whitworth, co-chair with Randy Bell, Northern Arizona University
12. Kari Wold, co-chair with Stephanie Moore, University of Kentucky
13. Eric Yoder, co-chair with Stephanie Moore, Instructional Technology

Current advisees

1. James Hong, Instructional Technology
2. Sarah Lilly, STEM Education
3. Anne McAlister, STEM Education
4. Kim Wilkens, Computer Science Education

Dissertation Committee Member

1. Christianna Andrews, Instructional Technology
2. Emily Barton, Instructional Technology
3. Ksenia Brazhnik, Department of Environmental Science
4. Devasmita Chakraverty, Science Education
5. Katherine Dabney, Science Education
6. Christopher Dittrick, Curriculum & Instruction
7. Ashley Hunt, Educational Psychology-Applied Developmental Science
8. Monty Jones, Instructional Technology
9. Xiaoqing Kong, Science Education
10. Peter Malcolm, Instructional Technology
11. Eileen Merritt, Educational Psychology-Applied Developmental Science
12. Bridget Mulvey, Science Education
13. Jesse Pappas, Social Psychology, Department of Psychology
14. James Rutter, Instructional Technology
15. Angela Skeeles-Worley, Science Education
16. Barbara Swartz, Mathematics Education
17. Daniel Tillman, Instructional Technology
18. Caner Uguz, Instructional Technology
19. Beverly Wood, Mathematics Education
20. Ningyu Zhang, Systems Engineering, Vanderbilt University

D. SERVICE

National Advisor/Advisory Board

- Graphing Research on Inquiry with Data in Science (GRIDS), National Science Foundation, PI: Marcia Linn. Advisory Board Member (2017-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, PI: Jennifer Maeng. Advisory Board Member (2019-present).
- Exploring Computation Integrated into Technology and Engineering. National Science Foundation, PI: Anthony Gordon. Advisory Board Member (2019-present).
- Jefferson Education Exchange. Educational Research Advisor (2018-present).

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 (2014-2016)
- 100kin10, University of Virginia representative (2015-present)

Service-oriented Presentations

- **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.
- **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.

Journal Peer Reviewer

- Editorial Board: Science Educator
- Journal of Learning Sciences
- Journal of Research in Science Teaching
- Instructional Science
- Journal of Pre-College Engineering Education Research
- Advances in Engineering Education
- Journal of Engineering Education
- Computers and Education
- Journal of Science Education and Technology
- Journal of Precollege Engineering Education Research
- Chemistry Education and Practice
- Theory into Practice
- International Journal of Engineering Education

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

- American Society for Engineering Education UVA Chapter Faculty Sponsor (2012-2016)
- National Science Teachers Association Student Chapter Faculty Sponsor (2010-2012)
- Curry-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 from Curry, Susan Bagby and James Groves from the School of Engineering and Applied Sciences (2013-2015)

Curry School of Education Service

- Curry Foundation Faculty Representative (2017-2020)
- Curry Faculty Council CISE Department Representative (2018-2020)
- Search Committee Member:
 - Teacher Education Administrative Manager, Department of Curriculum, Instruction, and Special Education (2011-2012)
 - ADHD/Youth-Nex Assistant Professor, Department of Human Services (2012)
 - STEM Education Open Rank Professor, Department of Curriculum, Instruction, and Special Education (2012-2013)
 - Nutrition Assistant/Associate Professor, Department of Kinesiology (2015-2016)
 - Educational Psychology/Applied Developmental Science Assistant Professor, Department of Leadership, Foundations & Policy (2015-2016)
 - Simulation, Department of Curriculum, Instruction, and Special Education (2016-2017)
- Promotions and Tenure, Internal Review Committee Member (2018-2019; 2019-2020)
- Graduation Committee (2010, 2011)
- STEM Education Research Brown Bag Seminars (2010, 2015, 2019)
- Design Initiative lead (2016-present)
- Youth and Social Innovation Affiliated Faculty (2017-present)

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

2020	Finalist for Charlottesville Business Innovation Council Partnership of the Year
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