YING-CHIH CHEN

Mary Lou Fulton Teachers College
Arizona State University
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CURRENT POSITION

Associate Professor — 2020-present
Division of Teacher Preparation, Mary Lou Fulton Teachers College, Arizona State University, Tempe, AZ

Assistant Professor — 2014-2020
Division of Teacher Preparation, Mary Lou Fulton Teachers College, Arizona State University, Tempe, AZ

PROFESSIONAL PREPARATION

Research Scientist — 2011-2014
STEM Education Center, University of Minnesota, St. Paul, MN

Ph.D., Science Education — 2007-2011
Minor: Educational Measurement and Statistics
University of Iowa, Iowa City, IA
Dissertation: Examining the Integration of Talk and Writing for Student Knowledge Construction through Argumentation

Mechanical Engineer
Electronic and Optoelectronic System Research Laboratories, Industry Technology Research Institution, Taiwan — 2001-2006

Teacher Certificate Program in Secondary Education — 1999-2001
National Chiao Tung University, Taiwan
Teaching Area: K7-12/ General Science, Physics, Engineering

M.S., Mechanical Engineering — 1999-2001
National Chiao Tung University, Taiwan
Thesis: Strength Analysis of a Frangible Laminated Composite Canister Cover

B.S., Mechanical Engineering — 1995-1999
National Sun Yat-Sen University, Taiwan
Thesis: Geometric Design and Manufacture of Bevel Gear

RESEARCH INTERESTS

Argumentation, Writing to Learn, Scientific Literacy, Dialogical Interaction in Classrooms, Uncertainty Management for Productive Struggle

Arizona State University website: https://education.asu.edu/about/people/ying-chih-chen
ResearchGate: https://www.researchgate.net/profile/Ying_Chih_Chen2
Google Scholar: https://scholar.google.com/citations?user=Fo_Pqv8AAAAJ&hl=en&oi=sra
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BIOGRAPHY

Dr. Ying-Chih Chen received his Ph.D. in 2011 from the University of Iowa specializing in science education with a minor in educational measurement and statistics. He was a research scientist in the STEM education center at the University of Minnesota from 2011-2014. Awarded tenure in 2020, he is currently an Associate Professor of the Mary Lou Fulton Teachers College at Arizona State University.

Dr. Ying-Chih Chen's research agenda focuses on how talk (e.g., self-explanation, group discussion, whole-class discussion) and writing (e.g., texts, diagrams, drawings, tables, letter) can be synergistically adapted as language tools to productively foster students to negotiate scientific arguments and come to consensus with one another in partner or group work in science classrooms. Dr. Chen has used longitudinal, ethnographic, mixed-methods, and quasi-experimental approaches to investigate (1) how the synergic use of talk and writing can best support students' knowledge development, social negotiation, and epistemic engagement in argument-based disciplinary discourse; (2) how the argumentative environment influences the development of students' reasoning abilities; and (3) how students' uncertainty can be adapted as pedagogical resources for knowledge development. Dr. Chen is currently a Principal Investigator on the National Science Foundation (NSF) funded project "Managing Uncertainty for Productive Struggle: Exploring Teacher Development for Managing Students' Epistemic Uncertainty as a Pedagogical Resource in Project-Based Learning" (08/01/2021-07/31/2024), and Co-Principal Investigator on the NSF funded project "AISecKG: AI for Cybersecurity Education via an ML-enabled Security Knowledge Graph" (05/01/2021-04/30/2023).

Dr. Ying-Chih Chen have received two prestigious awards that indicated my substantial effect on the field of science education: *2014 National Association for Research in Science Teaching (NARST) Outstanding Paper award* and *2017 NARST Early Career Research Award*. In addition to published research papers, he is also committed to sharing his research findings with teachers, educators, and policy makers in practitioner-oriented journals such as *Science and Children, Science Scope, Science Activities, The Reading Teacher,* and *The American Biology Teacher. One of his paper, "STEM in a hair accessory"* published in *Science and Children* has received the prestigious *REVERE award* from the 2015 *Association of American Publishers (AAP).*

PUBLICATIONS

Peer-reviewed Journal Articles

[* Denotes undergraduate student, graduate student, or postdoctoral collaborators during the time the manuscript was written]
[**Denotes in-service teacher collaborators during the time the manuscript was written]

1. Heal, M.**, Park, J.*, **Chen, Y.-C.**, Jordan, M. (In press). Fostering student curiosity in scientific practices: The SUPeR approach using student uncertainty as pedagogical resources. *Science Scope.*

2. Ha, H.*, **Chen, Y.-C.**, & Park, J.* (2024). Teacher strategies to support student navigation of uncertainty: Considering the dynamic nature of scientific uncertainty throughout phases of sensemaking. Science Education, 1–39. https://doi.org/10.1002/sce.21857

3. Starret, E.*, Jordan, M., **Chen, Y.-C.**, Meza-Torres, C.*, & Park, J.* (2024). Desirable uncertainty in science teaching: Exploring teachers' perceptions and practice of using student scientific uncertainty as a pedagogical resource. *Teaching and Teacher Education, 140,* 104456.

4. Ha, H.*, Park, J.*, & **Chen, Y.-C.** (2023). Conceptualizing phases of sensemaking as a trajectory for grasping better understanding: Coordinating student scientific uncertainty as a pedagogical resource. *Research in Science Education,* 1-33. https://doi.org/10.1007/s11165-023-10144-3

5. **Chen, Y.-C.,** & Jordan, M. (2023). Student Uncertainty as a Pedagogical Resource (SUPeR) approach for developing a new era of science literacy: Practicing and thinking like a scientist. *Science Activities,* 1-15. https://doi.org/10.1080/00368121.2023.2281694

6. Rapkiewcz, J.**, Park, J.*, **Chen, Y.-C.**, & Jordan, M. (2023). Student uncertainty as a pedagogical resource (SUPeR): Using the SUPeR approach to investigate electromagnetic force. *Science Scope, 46* (7), 34-41.

7. **Chen, Y.-C.,** Terada, T.*, & Aguirre-Mendez, C. (2023). Action research to explore argumentative writing projects supported with online simulation for developing conceptual knowledge and motivation to learn. *Reading and Writing, 36* (9), 2275-2317.

8. Zhang, Z., **Chen, Y.-C.,** He, G., She, H.-C., & Chen, J.-C. (2023). Thinking and practicing like a scientist?: Examining k-12 student mental images of scientists through a large-scale survey-based study. *Asia-Pacific Science Education, 9*(1), 75-105.

9. Agrawal, G.*, Deng, Y., Park., J. *, Liu, H., & **Chen, Y.-C.** (2022). Building knowledge graphs from unstructured texts: Application and impact analysis in cybersecurity education. *Information, 13(11), 526.*

10. Aguirre-Mendez, C., & **Chen, Y.-C.** (2022). An argumentative writing prompt model to support nonscience major students' learning in an introductory chemistry course. *Journal of College Science Teaching, 51* (6), 70-79.

11. **Chen, Y.-C.** (2022). Epistemic uncertainty and the support of productive struggle during scientific modeling for knowledge co-development. *Journal of Research in Science Teaching, 59*(3), 383-422.

12. Middleton, J., Krause, S., Judson, E., Ross, L., Culbertson, R., Hjelmstad, K. D., Hjelmstad, K. L., & **Chen, Y.-C.** (2022). A social network analysis of engineering faculty connections: Their impact on faculty student-centered attitudes and practices. *Education Sciences*, *12*(2), 108.

13. **Chen, Y.-C.,** & Terada, T.* (2021). Development and validation of an observation-based protocol to measure the eight scientific practices of the next generation science standards in k-12 science classrooms. *Journal of Research in Science Teaching, 58*(10), 1489-1526.

14. **Chen, Y.-C.,** & Techawitthayachinda, R. * (2021). Developing deep learning in science classrooms: Tactics to manage epistemic uncertainty during whole-class discussion. *Journal of Research in Science Teaching, 58*(8), 1083-1116.

15. Hand, B., **Chen, Y.-C.,** & Suh, J. K. (2021). Does a knowledge generation approach to learning benefit students? A systematic review of research on the science writing heuristic approach. *Educational Psychology Review, 33*(2), 535-577.

16. **Chen, Y.-C.,** Aguirre-Mendez, C., & Terada, T.* (2020). Argumentative writing as a tool to develop conceptual and epistemic knowledge in a college chemistry course designed for non-science majors. *International Journal of Science Education, 42*(17), 2842-2875.

17. **Chen, Y.-C.**, & Qiao, X*. (2020). Using students' epistemic uncertainty as a pedagogical resource to develop knowledge in argumentation. *International Journal of Science Education, 42*(13), 2145-2180.

18. Aguirre-Mendez, C., **Chen, Y.-C.**, Terada, T.*, & Techawitthayachinda, R*. (2020). Predicting components of argumentative writing and achievement gains in a general chemistry course for nonmajor college students. *Journal of Chemical Education, 97*(8), 2045-2056.

19. **Chen, Y.-C.** (2020). Dialogic pathways to manage uncertainty for productive engagement in scientific argumentation: A longitudinal case study grounded in an ethnographic perspective. *Science & Education, 29*(2), 331–375.

20. **Chen, Y.-C.**, Benus, M. J., & Hernandez, J. (2019). Managing uncertainty in scientific argumentation. *Science Education, 103* (5), 1235-1276. **(This paper was recognized as one of the top 10% most downloaded papers, published in *Science Education*, between January 2018 and December 2019)**

21. **Chen, Y.-C.** (2019). Using the Science Talk-Writing Heuristic (STWH) to build a new era of scientific literacy. *The Reading Teacher, 73* (1), 51-64.

22. Rillero, P., & **Chen, Y.-C.** (2019). The use of a digital problem-based learning module in science methods courses. *Journal of Problem Based Learning in Higher Education, 7* (1), 107-119.

23. Nunez-Eddy, E.*, Wang, X.*, & **Chen, Y.-C.** (2018). Engaging in argumentation: Strategies for early elementary and English language learners. *Science & Children*, 56(2), 51-59.

24. **Chen, Y.-C.,** Mineweaser, L.*, Accetta, D.*, & Nooan, D*. (2018). Connecting argumentation to 5 E inquiry for preservice teachers. *Journal of College Science Teaching, 47* (5), 22-28.

25. Nam, Y., & **Chen, Y.-C.** (2017). Promoting argumentative practice in socio-scientific issues (SSI) through a science inquiry activity. *EURASIA Journal of Mathematics, Science & Technology Education. 13* (7), 3431-3461.

26. **Chen, Y.-C.,** Hand, B, & Norton-Meier, L. (2017). Teacher roles of questioning in early elementary science classrooms: A framework promoting student cognitive complexities in argumentation. *Research in Science Education*. *47* (2), 373-405.

27. **Chen, Y.-C.,** Park, S., & Hand, B. (2016). Examining the use of talk and writing for students' development of scientific knowledge through constructing and critiquing arguments. *Cognition & Instruction. 34* (2), 100-147.

28. **Chen, Y.-C.,** Hand, B., & Park, S. (2016). Examining elementary students' development of oral and written argumentation practices through argument-based inquiry. *Science & Education, 25* (3), 277-320.

29. **Chen, Y.-C.,** Benus, M. J., & Yarker, M. (2016). Using models to support argumentation in the science classroom. *The American Biology Teacher. 78 (7), 549-559.*

30. Hand, B, Cavagnetto, A., **Chen, Y.-C.,** & Park, S. (2016). Moving past curricula and strategies: Language and the development of adaptive pedagogy for immersive learning environments. *Research in Science Education. 46*(2), 223-241.

31. **Chen, Y.-C.,** Moore, T., & Wang, H.-H. (2014). Construct, critique, and connect: Engineering as a vehicle to learn science. *Science Scope, 38* (3), 58-69.

32. Wang, H.-H., Billington, B., & **Chen, Y.-C.** (2014). STEM in a hair accessory. *Science and Children, 52* (2), 3-8. **(This paper was awarded the Association of American Publishers (AAP) Revere award)**

33. **Chen, Y.-C.,** & Lin, J.-L., & Chen, Y.-T. (2014). Teaching scientific core ideas through immersing students in argument: Using density as an example. *Science Activities, 51*(3), 78-88.

34. **Chen, Y.-C.,** & Steenhoek, J.** (2014). Arguing like a scientist: Engaging students in core scientific practices. *The American Biology Teacher, 76* (4), 231-237.

35. **Chen, Y.-C.**, Hand, B., & McDowell, L.** (2013). The effects of writing-to-learn activities on elementary students' conceptual understanding: Learning about force and motion through writing to older peers. *Science Education, 97* (5), 745-771.

36. **Chen, Y.-C.** (2013). Writing an argument to a real audience: Alternative ways to motivate students in writing about science. *Teaching Science: The Journal of the Australian Science Teachers Association, 59 (4), 8-12.*

37. **Chen, Y.-C.,** & Steenhoek, J.** (2013). A negotiation cycle to promote argumentation in science classrooms. *Science Scope, 36* (9), 41-50.

38. **Chen, Y.-C.,** Park, S., & Hand, B. (2013). Constructing and critiquing arguments: Four communication strategies help students discuss, defend, and debunk ideas. *Science & Children, 50* (5), 40-45.

39. Park, S., & **Chen, Y.-C.** (2012). Mapping out the integration of the components of pedagogical content knowledge (PCK): Examples from high school biology classrooms. *Journal of Research in Science Teaching, 49* (7), 922-941.

40. Park, S., Jang, J., **Chen, Y.-C.**, & Jung, J. (2011). Is pedagogical content knowledge (PCK) necessary for reformed science teaching?: Evidence from an empirical study. *Research in Science Education, 41* (2), 245-260.

41. **Chen, Y.-C.**, Tseng, C.-M., & Chang, W.-H. (2010). The role of the teacher in engaging elementary school students in argumentation utilizing science writing heuristic: Four-year case studies. *Chinese Journal of Science Education, 18* (5), 417-442.

42. **Chen, Y.-C.**, & Tsai, C.-C. (2009). An educational research course facilitated by online peer assessment. *Innovations in Education and Teaching International, 46* (1), 105-117.

43. Chen, Y.-T., & **Chen, Y.-C.** (2008). The analysis of epistemologies about different background patriarchs in the context of parent-child book-reading interactions. *Chinese Journal of Science Education, 16* (3), 325-350.

Book Chapter (Invited)

1. **Chen, Y.-C.** (2019). Writing as an epistemological tool: Perspectives from personal, disciplinary, and sociocultural landscapes. In V. Prain & B. Hand (Eds.), *Theorizing the Future of Science Education Research*, vol 49, 115-132. Switzerland AG: Springer, Cham.

Book Review (Invited)

1. Park. J.*, & **Chen, Y.-C.** (2022). Mathematics as the science of patterns: Making the invisible visible to students through teaching, by Jenlink P. M. (Editor). Charlott, NC: Information Age Publishing. 2022, 251 pp. ISBN: 978-1-64802-744-4. Book Review, *Teachers College Record.*

2. **Chen, Y.-C.** (2022). Is uncertainty a barrier or resource to advance science? The role of uncertainty in science and its implications for science teaching and learning. *Science & Education, 31* (2), 543–549.

3. **Chen, Y.-C.** (2021). "Talking Science" to "Discourse Strategies": Perspective shifting from "knowing" to "doing" the language of science. *Science Education, 105*(4), 814-821.

4. **Chen, Y.-C.** (2015). Einstein fellows: Best practices in STEM education, by Tim Spuck & Leigh Jenkins (Editors). New York, NY: Peter Lang Publishing. 2014, 410

pp. ISBN: 1433121948. Book Review, *Teachers College Record.* http://www.tcrecord.org/content.asp?contentid=18125 ID Number: 18125

CONFERENCE PROCEEDINGS

1. Park, J.*, Starret, E.*, **Chen, Y.-C.,** & Jordan, M. (2022). Facilitating productive struggle in science education: The possible benefits of managing scientific uncertainty during sensemaking. In. Chinn, C., Tan, E., Chan, C., & Kali, Y. (Eds.). *Proceedings of the 16th International Conference of the Learning Sciences - ICLS 2022* (pp. 1117-1120). Hiroshima, Japan: International Society of the Learning Sciences.
2. Ha, H.*, Park, J.*, & **Chen, Y.-C.** (2022). Strategies to manage scientific uncertainties for productive sensemaking: Case studies from Korean and American classrooms. In. Chinn, C., Tan, E., Chan, C., & Kali, Y. (Eds.). *Proceedings of the 16th International Conference of the Learning Sciences - ICLS 2022.* (pp. 1846-1847). Hiroshima, Japan: International Society of the Learning Sciences.
3. Techawitthayachinda, I. R.*, Deng, Y., Zeng, Z.*, Liu, H., **Chen, Y. C.**, & Huang, D. (2022). An AI-enable knowledge graph and student's agency in productive struggle during problem-based learning in cybersecurity education. *The IAFOR International Conference on Education in Hawaii 2022 Official Conference Proceedings* (pp.441 - 449). Japan, Aichi: The International Academic Forum (IAFOR).
4. **Chen., Y.-C.** (2018). Uncertainty management in argumentation: Resources, productiveness, and teacher knowledge for and in practice. In J. Settlage & A. Johnston (Eds.), *Proceedings of the 2018 Science Education at the Crossroads Conference* (pp. 10-11). Alta, Utah. [Available online at www.sciedxroads.org/proceedings2018.html].
5. Cullicott, C. E.*, & **Chen, Y.-C.** (2018). Uncertainty management in science argumentation. In J. Kay & R. Luckin (Eds.), *Rethinking learning in the digital age: Making the learning sciences count: 13th International Conference of the Learning Sciences (ICLS) 2018, Volume 3,* (pp. 1479-1480). London, United Kingdom: International Society of the Learning Sciences.
6. **Chen, Y.-C.**, & Qiao, X.* (2018). Dialogic teaching to establish consensus in argumentation. In Finlayson, O., McLoughlin, E., Erduran, S., & Childs, P. (Eds.), *Electronic Proceedings of the ESERA 2017 Conference. Research, Practice and Collaboration in Science Education, Discourse and Argumentation in Science Education [part7/strand 7]* (co-ed. Maria Andrée, M. & Viiri, J.), (pp. 929-936). Dublin, Ireland: Dublin City University. ISBN 978-1-873769-84-3
7. Qiao, X.* & **Chen, Y.-C.** (2018). Strategies and resources for a fifth-grade science teacher's uncertainty management in argumentation. In Finlayson, O., McLoughlin, E., Erduran, S., & Childs, P. (Eds.), *Electronic Proceedings of the ESERA 2017 Conference. Research, Practice and Collaboration in Science Education, Discourse and Argumentation in Science Education [part7/strand 7]* (co-ed. Maria Andrée, M. & Viiri, J.), (pp. 937-944). Dublin, Ireland: Dublin City University. ISBN 978-1-873769-84-3
8. **Chen, Y.-C.**, & Hand. B. (2014). The roles of teacher questioning in argument-

based inquiry (ABI): Approaches that promote cognitive thinking and dialogical interaction. Polman, J. L., Kyza, E. A., O'Neill, D. K., Tabak, I., Penuel, W. R., Jurow, A. S., O'Connor, K., Lee, T., and D'Amico, L. (Eds.), *Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014, Volume 2,* (pp. 641-648). Boulder, CO: International Society of the Learning Sciences.

9. Nam, Y., & **Chen, Y.-C.** (2014). Pre-service science teachers' argumentation about a socio-scientific issue through an inquiry activity using a physical model. *6th International Conference on Education and New Learning Technologies.* Barcelona, Spain.
10. **Chen, Y.-C.,** Park, S., & Hand, B. (2012). Unpacking the use of talk and writing in argument-based inquiry: Instruction and cognition. In J. van Aalst, K. Thompson, M. J. Jacobson & P. Reimann (Eds.), *The future of learning: Proceedings of the 10th international conference of the learning sciences (ICLS 2012) – Volume 1,* (pp. 159-166). Sydney, Australia: International Society of the Learning Sciences.
11. Alonzo, A., **Chen, Y.-C.**, & Seidel, T. (2010). A framework for examining video evidence of teachers' content-based classroom interactions. In M. F. Taşar & G. Çakmakci (Eds.), *Contemporary science education research: Proceeding of the biannual meeting of European Science Education Research Association (ESERA)* (pp. 249-259). Ankara, Turkey: Pegem Akademi.

CONFERENCE PRESENTATIONS

1. Avarzaman, F.*, Golshani, S.*, **Chen, Y.-C.** (2024). *Examining US primary science classes as reflected in practitioner literature: a disciplinary literacy approach.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Philadelphia, PA.
2. Park, J.*, Starret, E.*, Meza-Torres, C.*, **Chen, Y.-C.**, & Jordan, M. (2024). *Understanding multiple dimensions of how students manage uncertainty for productive struggles.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Philadelphia, PA.
3. Starret, E.*, Meza-Torres, C.*, Park, J.*, Jordan, M., **Chen, Y.-C.** (2024) *Science teachers' perceptions and practice of uncertainty: The changes experienced after engaging in professional development.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Philadelphia, PA.
4. Park, J.*, Starret, E.*, Meza-Torres, C.*, **Chen, Y.-C.,** & Jordan, M. (2024). *Uncertainty management for productive struggle scale.* Paper will be presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Denver, CO.
5. Avarzaman, F.*, Golshani, S.*, **Chen, Y.-C.** (2024). *Analysis of primary science education in the united states through the lens of practitioner literature*. Paper will be presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Denver, CO.

6. **Chen, Y.-C.**, Park, J.*, Deng, Y., Agrawal, G.*, & Liu, H. (2024). *Development and validation of an uncertainty management survey in problem-based learning.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), New Orleans, LA.
7. Avarzaman, F.*, Golshani, S.*, **Chen, Y.-C.** (2024). Examining NGSS and CCSS Adaptation in US Primary Schools: A Study of the Science and Children Magazine's Lessons with a Focus on Disciplinary Literacy. Paper will be presented at the annual meeting of Association for Science Teacher Education (ASTE), New Orleans, LA.
8. Park, J.*, **Chen, Y.-C.**, Deng, Y., Agrawal, G.*, & Liu, H. (2023). *Meta-agency in problem-based learning: How do students exercise their agency?.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Chicago, IL.
9. Park, J.*, **Chen, Y.-C.**, Jordan, M., Starrett, E.*, & Meza-Torres, C.* (2023). *Conceptual framework for incorporating student uncertainties into science learning.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Chicago, IL.
10. Park, J.*, **Chen, Y.-C.**, Deng, Y., Agrawal, G.*, & Liu, H. (2023). *Assessing college students' uncertainty management in problem-based learning: Development of a questionnaire instrument.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Chicago, IL.
11. Park, J.*, **Chen, Y.-C.**, Deng, Y., Agrawal, G.*, & Liu, H. (2023). *Problems of problem-based learning: Exploring meta-agency in problem-based cybersecurity learning in college education.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Chicago, IL.
12. Park, J.*, **Chen, Y.-C.**, Deng, Y., Agrawal, G.*, & Liu, H. (2023). *Development and validation of the uncertainty management in problem-based learning scale in postsecondary STEM education.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Chicago, IL.
13. Park, J.*, **Chen, Y.-C.**, Jordan, M., Starrett, E.*, & Meza-Torres, C.* (2023). *Theoretical framework for understanding student experiences of productive struggle: Types, sources and desirability of uncertainties.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Chicago, IL.
14. Starret, E.*, Jordan, M., **Chen, Y.-C.**, Meza-Torres, C.*, & Park, J.* (2023). *Exploring science teachers' perceptions and management of students' desirable uncertainty.* Paper will be presented at the annual meeting of the American Educational Research Association (AERA), Chicago, IL.
15. **Chen, Y.-C.**, Jordan, M. Park, J.*, & Starrett, E.* (2022). *Productive struggle: Managing scientific uncertainty for sensemaking in argumentation.* Paper presented at European Association for Research on Learning and Instruction (EARLI) SIG20 (Inquiry learning)-26 (Argumentation, Dialogue, and Reasoning) meeting, Utrecht, Netherlands.

16. **Chen, Y.-C.**, Park, J.*, Starrett, E.*, & Jordan, M. (2022). *Managing scientific uncertainty for conceptual change: a theoretical framework for productive struggle in sense making*. Paper presented at European Association for Research on Learning and Instruction (EARLI) SIG312th International Conference on Conceptual Change, Zwolle, Netherlands.
17. Ha, H., **Chen, Y.-C.**, & Park, J.* (2022). *Instructional strategies to manage scientific uncertainties for productive sensemaking: Exploring Korean and American classrooms.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Vancouver, Canada.
18. Hu, P.*, Liang, L. L., **Chen, Y.-C.**, *&* Terada, T.* (2022). *Examining NGSS scientific practices in k-12 science classrooms.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST), Vancouver, Canada.
19. **Chen, Y.-C.,** & Terada, T.* (2022). *ICAP to measure by observation NGSS scientific practice implementation in the classroom (IONIC).* Paper presented at the annual meeting of the American Educational Research Association (AERA), San Diego, CA.
20. **Chen, Y.-C.** (2021). *Strategies to manage uncertainty in the contexts of whole-class discussion: A Design-based study in scientific argumentation*. Paper presented at the annual meeting of the American Educational Research Association (AERA) (Virtual form)
21. Hu, P.*, Liang, L. L., **Chen, Y.-C.**, *&* Terada, T* (2021). *Examining elementary science teaching: A video analysis of NGSS scientific practices*. Paper presented at the annual meeting of the American Educational Research Association (AERA) (Virtual form)
22. **Chen, Y.-C.** (2021). *Strategies to manage uncertainty in scientific argumentation.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST) (Virtual form)
23. Hu, P.*, Liang, L. L., **Chen, Y.-C.**, *&* Terada, T* (2021). *Implementation of NGSS scientific practices in elementary science classrooms: A comparative study of video analysis.* Paper presented at the annual meeting of the National Association for Research in Science Teaching (NARST) (Virtual form)
24. Aguirre-Mendez, C., **Chen, Y.-C.**, *&* Terada, T*. (2020). *The effect of argumentative writing to promote nonscience major students' learning in a chemistry course*. Poster accepted by the annual meeting of National Association for Research in Science Teaching (NARST), Portland, OR. (conference cancelled)
25. Rillero, P. & **Chen, Y.-C.** (2020). P*reparing professionals for multilingual classroom realities: promising practices for the present.* Poster accepted by the annual meeting of National Association for Research in Science Teaching (NARST), Portland, OR. (conference cancelled)
26. Aguirre-Mendez, C., **Chen, Y.-C.**, Terada, T*. (2020). T*he effect of argumentative writing to promote nonscience major students' learning in an introductory chemistry course*. Paper accepted by the annual meeting of the American Educational Research Association (AERA), San Francisco, CA. (conference cancelled)

27. Rillero, P. & **Chen, Y.-C.** (2020). *preparing professionals for multilingual classroom realities: promising practices for the present.* Paper accepted by the annual meeting of the American Educational Research Association (AERA), San Francisco, CA. (conference cancelled)
28. Rillero, P. & **Chen, Y.-C.** (2020). *Lesson study for preparing preservice elementary teachers for science PBL and working with language minority children.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), San Antonio, TX.
29. Sahin, Ercin*, **Chen, Y.-C.**, & Hand, B. (2019). *Describing students' reasoning in an immersive argument-based science inquiry*. Paper presented at the International Conference on Education in Mathematics, Science & Technology (ICEMST), Cesme, Turkey.
30. Ross, L.*, Mayled, L. H., Krause, S. J., Judson, E., Hjelmstad, K. D., Middleton, J. A., Culbertson, R. J., Ankeny, C. J., **Chen, Y.-C.,** Hjelmstad, K. L., Glassmeyer, K., Hoyt, S. (2019). *Scaling and assessment of an evidence-based faculty development program for promoting active learning pedagogical strategies*. Paper presented at the annual meeting of the American Society for Engineering Education (ASEE), Tampa, FL.
31. Techawitthayachinda, R.*, **Chen, Y.-C.**, & Tsai, C.-C. (2019). *Productivities of uncertainty management in argumentation*. Paper presented at the annual meeting of the American Educational Research Association (AERA), Toronto, Canada.
32. Techawitthayachinda, R.*, **Chen, Y.-C.**, & Tsai, C.-C. (2019). *Teachers scaffold students to manage uncertainty in scientific argumentation*. Poster presented at the annual meeting of the American Educational Research Association (AERA), Toronto, Canada.
33. Aguirre-Mendez, C., **Chen, Y.-C.**, Techawitthayachinda, R.*, & Terada, T*. (2019). *The effect of argumentative writing on achievement in college general chemistry for non-science majors students*. Paper presented at the annual meeting of the American Educational Research Association (AERA), Toronto, Canada.
34. Techawitthayachinda, R.*, & **Chen, Y.-C.** (2019). *Uncertainty management productivities in argumentation.* Paper presented the annual meeting of National Association for Research in Science Teaching (NARST), Baltimore, MA.
35. Techawitthayachinda, R.*, & **Chen, Y.-C.** (2019). *Conditions teachers scaffold students' uncertainty management in argumentation.* Poster presented the annual meeting of National Association for Research in Science Teaching (NARST), Baltimore, MA.
36. Aguirre-Mendez, C., **Chen, Y.-C.**, Techawitthayachinda, R.*, & Terada, T*. (2019). *Argumentative writing assignments: Using writing to improve college non science major achievement and argumentation.* Paper presented the annual meeting of National Association for Research in Science Teaching (NARST), Baltimore, MA.
37. Rillero, P. & **Chen, Y.-C.** (2019). *Teacher candidate perspectives on problem-based learning module in science methods courses.* Poster presented the annual meeting of National Association for Research in Science Teaching (NARST), Baltimore, MA.

38. Rillero, P. & **Chen, Y.-C.** (2019). *Preparing new teachers for problem-based learning: use and perspectives of a PBL module in science methods courses.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), Savannah, GA. **(This paper is nominated for 2019 ASTE John C. Park National Technology Leadership Initiative Award)**
39. **Chen, Y.-C.,** Hernandez, J., & Qiao, X.* (2018). *Dialogical teaching to managing uncertainty in argumentative practice.* Paper presented at the annual meeting of the American Educational Research Association (AERA), New York City, NY.
40. Qiao, X. *, & **Chen, Y.-C.** (2018). *A fifth-grade science teacher's attempts to manage uncertainty in argumentation.* Poster presented at the annual meeting of the American Educational Research Association (AERA), New York City, NY.
41. Qiao, X. *, & **Chen, Y.-C.**, Hernandez, J., & Tsai, C.-C. (2018). *Resources for managing uncertainty during argumentation in a fifth-grade science classroom.* Paper presented the annual meeting of National Association for Research in Science Teaching (NARST), Atlanta, GA.
42. Krause, S., Judson, E., Hjelmstad, K., Middleton, J., Culbertson, R., Ankeny, C. J., **Chen, Y.-C.**, Ross, L.*, Mayled, L. H., & Hjelmstad, K. L. (2018). *A multidisciplinary professional development program that shifts faculty attitudes and practice toward evidence-based instructional strategies (EBIS) for teaching and learning.* Paper presented the annual meeting of American Association of Engineering Education (ASEE), Salt Lake City, UT.
43. Krause, S., Judson, E., Hjelmstad, K., Middleton, J., Culbertson, R., Ankeny, C. J., **Chen, Y.-C.**, Ross, L.*, Mayled, L. H., & Hjelmstad, K. L. (2018). *Assessing faculty and organizational change in a professional development program with workshops and disciplinary communities of practice.* Paper presented the annual meeting of American Association of Engineering Education (ASEE), Salt Lake City, UT.
44. Hjelmstad, K. L., Hjelmstad, K., Krause, S., Mayled, L. H., Judson, E., Ross, L.*, Culbertson, R., Middleton, J., & **Chen, Y-C.** (2018). *Facilitating change in instructional practice in a faculty development program through classroom observations and formative feedback coaching.* Paper presented the annual meeting of American Association of Engineering Education (ASEE), Salt Lake City, UT.
45. Middleton, J., Judson, E., Krause, S., Culbertson, R., Hjelmstad, K., Mayled, L. H., Ross, L.*, Hjelmstad, K., & **Chen, Y-C.** (2018). *Social network analysis of faculty connections in a multi-year professional development program.* Paper presented the annual meeting of American Association of Engineering Education (ASEE), Salt Lake City, UT.
46. **Chen, Y.-C.,** & Qiao, X. * (2017). *Dialogic teaching to establish consensus in argumentation.* Paper presented the annual meeting of European Science Education Research Association (ESERA), Dublin, Ireland.
47. Qiao, X. *, & **Chen, Y.-C.** (2017). *Strategies and resources of a fifth-grade science teacher's uncertainty management in argumentation.* Paper presented the annual meeting of European Science Education Research Association (ESERA), Dublin, Ireland.

48. **Chen, Y.-C.** (2017). *Dialogic teaching to establish consensus: Social negotiation, epistemic engagement, conceptual development*. Paper presented the annual meeting of National Association for Research in Science Teaching (NARST), San Antonio, TX.
49. Rudolph, A. *, Yoho, R., **Chen, Y.-C.,** & Vanmali, B. (2017). *Student use of and attitudes towards the textbook in an introductory biology course.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), Des Moines, IA.
50. Ross, L., Krause, S., Hjelmstad, K., Midldeton, J., Judson, E., Culbertson, R., Ankeny, C., Mayled, L., **Chen, Y.-C.,** Park, Y. S., Smith, B., & Lopez, E. (2017, November). *Scaling a faculty professional development program to multiple disciplines to promote active learning strategies in classroom instruction.* Paper presented at the Association for the Study of Higher Education Conference (ASHE), Houston, TX.
51. Krause, S. J., Middleton, J. A., Hjelmstad, K. D., Judson, E., Culbertson, R. J., Ankeny, C. J., **Chen, Y.-C.,** Ross, L.*, Mayled, L. H., Lopez, E., Park Y. S., & Smith, B. B. (2017, June). *Scaling a faculty professional development program to multiple disciplines through disciplinary communities of practice evolving from evidence-based workshops.* Poster presented at the American Association of Engineering Education (ASEE), Columbus, OH.
52. **Chen, Y.-C.** (2016). *Constructing and critiquing arguments in science classrooms: Perspectives from both sociocultural development and linguistics.* Paper presented the annual meeting of National Association for Research in Science Teaching (NARST), Baltimore, MA.
53. **Chen, Y.-C.** (2016, keynote speaker). *The roles of teacher questioning in argumentation: approaches that promote cognitive thinking and dialogical interaction.* Paper presented at the annual meeting of Korean Association for Science Education International Conference, Daegu, Korea.
54. Judson, E., Ross, L.*, Middleton, J. A., Krause, S. J., Ankeny, C. J., **Chen, Y.-C.**, Culbertson, R. J., Hjelmstad, K. D., & Park. Y. (20016). *Measuring dispositions toward teaching strategies and their reported use.* Paper presented at the annual meeting of the American Association of Engineering Education, New Orleans, LA.
55. Ross, L.*, Judson, E., Krause, S. J., Middleton, J. A., Ankeny, C. J., **Chen, Y.-C.**, Culbertson, R. J., Hjelmstad, K. D., Park, Y, & Smith, B. B. (2016, June). *How do male and female faculty members view and use classroom strategies?* Paper presented at the annual meeting of the American Association of Engineering Education, New Orleans, LA
56. **Chen, Y.-C.** (2015). *Scientific discourse in three elementary classrooms: Teacher's role of questioning in engaging students in argumentation.* Paper presented at 2nd International Conference on Argument-based Inquiry (ABI), Spokane, WA.
57. Judson, E., Ernzen, J., **Chen, Y.-C.**, Krause, S. J., Middleton, J. A., & Beeley, K. (2015). *How Next Generation engineering design standards are interpreted and applied by various stakeholders.* Poster presented at the annual meeting of the American Association of Engineering Education, Seattle, WA.
58. Ernzen, J., Judson, E., Krause, S. J., Collofello, J., **Chen, Y.-C.**, Beeley, K., &

Culbertson, R. (2015). *Effect of student-centered programs on retention of engineering students.* Paper presented at the annual meeting of the American Association of Engineering Education, Seattle, WA.

59. Krause, S. J., Middleton, J. A., Judson, E., Ernzen, J.*, Beeley, K., & **Chen, Y.-C.** (2015). *Factors impacting retention and success of undergraduate engineering students.* Paper presented at the annual meeting of the American Association of Engineering Education, Seattle, WA.
60. Middleton, J. A., Krause, S. J., Beeley, K., Judson, E., Ernzen, J.*, & **Chen, Y.-C.** (2015). *Examining relationships and patterns in pedagogical beliefs, attitudes and classroom practices for faculty of undergraduate engineering, and math, and science foundational courses.* Paper presented at the annual meeting of the American Association of Engineering Education, Seattle, WA.
61. **Chen, Y.-C.** (2015). *Argumentation for all students: An immersion approach to promote students' construction and critique of scientific knowledge through talk and writing.* Paper presented the annual meeting of National Association for Research in Science Teaching (NARST), Chicago, IL.
62. **Chen, Y.-C.** & Hand, B. (2014). *Promoting science talk: The teacher's role of questioning in argumentation.* Paper presented at the annual meeting of the American Educational Research Association (AERA), Philadelphia, PA
63. **Chen, Y.-C.**, Park, S., & Hand, B. (2014). *Knowledge development trajectory: Mapping the way of using language as a learning tool in argument-based inquiry.* Poster presented at the annual meeting of the American Educational Research Association (AERA), Philadelphia, PA.
64. **Chen, Y.-C.** & Hand, B. (2014). *Teacher's role of questioning: Approaches that promote student cognitive complexities and dialogical interaction in argumentation.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Pittsburgh, PA. **(This paper is nominated for 2014 NARST Outstanding Paper Award)**
65. **Chen, Y.-C.**, Hand, B, & Benus, M. (2014). *The roles of teacher questioning in argument-based inquiry (ABI) science classrooms: Approaches that stimulate cognitive thinking and dialogical interaction.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), San Antonio, TX. **(This paper is nominated for 2014 ASTE Award IV)**
66. Suh, J. K., **Chen, Y.-C.**, & Hand, B. (2014). *Immersive argument-based inquiry practice in science classrooms: Dissertation research on science writing heuristic approach.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), San Antonio, TX.
67. Wang, H.-H., & **Chen, Y.-C.** (2014). *The relationship between written and oral arguments.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), San Antonio, TX.
68. **Chen, Y.-C.**, Park, S., & Hand, B. (2013). *Tracing elementary students' use of talk and writing for knowledge construction through argument-based inquiry.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Rio Grande, Puerto Rico. **(This paper is awarded 2014 NARST Outstanding Paper Award)**

69. Suh, J. K., **Chen, Y.-C.**, & Hand, B. (2013). *Understanding immersive argument-based inquiry: A critical review of thesis studies on the science writing heuristic approach*. Poster presented at the annual meeting of National Association for Research in Science Teaching (NARST), Rio Grande, Puerto Rico.
70. Varma, K., Ross, P., Huffman, D., Roehrig, G., **Chen, Y.-C.,** McGuire, L., & Lawrenz, F. (2013). *Unpacking the elements of scientific reasoning*. Poster presented at the annual meeting of National Association for Research in Science Teaching (NARST), Rio Grande, Puerto Rico.
71. **Chen, Y.-C.,** Hand, B., & Park, S. (2013). *Knowledge development trajectory: Identifying the way of using language as an epistemological tool for knowledge construction and critique through argument-based inquiry (ABI)*. Paper presented at 1st International Conference on Immersion approaches to Argument-based Inquiry (ABI) Approaches for Science Classrooms, Pusan, Korea.
72. Suh, J. K., **Chen, Y.-C.**, & Hand, B. (2013). *Understanding immersive argument-based inquiry: A critical review of thesis studies on science writing heuristic approach.* Poster presented at 1st International Conference on Immersion approaches to Argument-based Inquiry (ABI) Approaches for Science Classrooms, Pusan, Korea.
73. Nam, Y., **Chen, Y.-C.**, & Roehrig, G. (2013). *Pre-service science teachers' argumentation around model based inquiry using socio-scientific issue.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), Charleston, SC.
74. **Chen, Y.-C.**, Hand, B., & Park, S. (2012). *Beyond "doing the lesson": The nature of argumentation in a fifth-grade classroom.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Indianapolis, IN. **(This paper is nominated for 2013 NARST Outstanding Paper Award)**
75. **Chen, Y.-C.**, Hand, B., & McDowell, L. (2011). *Impact on year 4 student conceptual understanding of force and motion after writing letters to year 11 students.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Orlando, FL.
76. Park, S., & **Chen, Y.-C.** (2011). *Mapping out the Integration of the components of Pedagogical Content Knowledge (PCK) for teaching photosynthesis and heredity.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Orlando, FL. **(This paper is nominated for 2012 NARST Outstanding Paper Award)**
77. **Chen, Y.-C.**, Hand, B., & McDowell, L. (2011). *The effect of writing letters to older peers on year 4 students' conceptual understanding of force and motion*. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), New Orleans, LA.
78. **Chen, Y.-C.**, Hand, B., Norton-Meier, L., & Park, S. (2011). *The effect of integrating talking and writing for argumentation in the context of the Science Writing Heuristic (SWH) approach*. Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), Minneapolis, MN.
79. **Chen, Y.-C.**, Chanlen, N., Cheng, C., Hand, B., & Norton-Meier, L. (2011). *Role of the teacher in engaging elementary school students in argumentation: Four year longitudinal study.* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), Minneapolis, MN.

80. Yoon, S., **Chen, Y.-C., &** Park, S. (2011). *Improving high school biology teachers' pedagogical content knowledge using a web-based video analysis tool (VAT).* Poster presented at the annual meeting of Association for Science Teacher Education (ASTE), Minneapolis, MN.
81. **Chen, Y.-C.**, Hand, B., & McDowell, L. (2010). *The impact of writing for older aged peers.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Philadelphia, PA.
82. Basir, M., Penny, B., **Chen, Y.-C.**, Chanlen, N., & Cheng, C., Hand, B., & Norton-Meier, L. (2009). *The role of teaching practice in transformation of teachers in inquiry-based environment.* Poster presented at the Iowa Educational Research and Evaluation Association annual conference, Ames, IA.
83. Park, S., Jang, J., & **Chen, Y.-C.** (2009). *Can we measure teachers' pedagogical content knowledge using surveys? Developing measures of PCK for teaching high school.* Paper presented at the annual meeting of National Association for Research in Science Teaching (NARST), Garden Grove, CA.
84. Park, S., Jang, J., & **Chen, Y.-C.** (2009). *Is Pedagogical Content Knowledge (PCK) necessary for reformed science teaching?* Paper presented at the annual meeting of Association for Science Teacher Education (ASTE), Hartford, CT.
85. **Chen, Y.-C.**, & Tsai, C.-C., (2008). *A graduate-level educational research course facilitated by online peer assessment.* Paper presented at the annual meeting of the American Educational Research Association (AERA), New York, NY.
86. Park, S., **Chen, Y.-C.**, & Jang, J. (2008). *Developing measures of teachers' pedagogical content knowledge for teaching high school biology.* Paper presented at the annual Meeting of the Association for Science Teacher Education (ASTE), St. Louis, MO.
87. Chen, Y.-T., Leou, S., Liang, J.-C., & **Chen, Y.-C.** (2005). *One reflexivity and action teaching of the teacher from the secondary education cross kindergarten teachers' education.* Paper presented at the International Conference on Computers in Education, Singapore.

INVITED TALKS

International

1. Chen, Y.-C. (2024, December). *Navigating student scientific uncertainty for productive struggle in science education.* Taiwan Association for Science Education International Conference, National Taiwan Normal University. Taipei, Taiwan.
   Attendees: 80

2. Chen, Y.-C. (2024, December). *Global futures for all: Sustainability and energy literacy for global future education.* National Tainan University. Tainan, Taiwan.
   Attendees: 50

3. Chen, Y.-C. (2024, December). *Global futures for all: Sustainability and energy literacy for global future education.* National Chiayi University. Chiayi, Taiwan.
   Attendees: 50

4. Chen, Y.-C. (2024, December). *Building a new era of scientific literacy to meet the NGSS (Next Generation Science Standards): Understanding uncertainty's role.* National Yang Ming Chiao Tung University, Hsinchu, Taiwan.
   Attendees: 50

5. Chen, Y.-C. (2019, October). *The place of argumentation in the science curriculum: argumentation as an enterprise of managing uncertainty.* Beijing Normal University, Beijing, China.
   Attendees: 30

6. Chen, Y.-C. (2018, July). *Uncertainty management in argumentation: Resources, productiveness, and teacher knowledge for and in practice.* Program of Learning Sciences, National Taiwan Normal University, Taipei, Taiwan.
   Attendees: 25

7. Chen, Y.-C. (2016, August). *The role of language in scientific argumentation: The synergic use of talk and writing.* European Science Education Research Association (ESERA) Summer School, University of South Bohemia, Ceske Budejovice , Czech Republic.
   Attendees: 60

8. Chen, Y.-C. (2016, January). *The roles of teacher questioning in argumentation: approaches that promote cognitive thinking and dialogical interaction.* Korean Association for Science Education International Conference, Kyungpook National University, Daegu, Korea.
   Attendees: 50

National

1. Chen, Y.-C. (2021, March). *Argumentation as an enterprise of managing uncertainty*. The Chemistry Education Program, Emporia State University, Emporia, KS. (Talk via zoom).
   Attendees: 15

2. Chen, Y.-C. (2020, November). *Managing uncertainty for productive struggles in argumentation.* The Math/Science Education PhD program, Washington State University, Pullman, WA. (Talk via zoom).
   Attendees: 15

3. Chen, Y.-C. (2017, October). *Landscape of research on teacher knowledge and practices for argumentation.* Division of Biological Sciences Seminar Program, University of California at San Diego, San Diego, CA.
   Attendees: 20

4. Chen, Y.-C. (2017, October). *New era of literacy for scientific practice and inquiry: The synergetic use of talk and writing in argumentation.* Mathematics and Science Education Doctoral Program (MSED), University of California at San Diego and San Diego State University, San Diego, CA.
   Attendees: 20

College

1. Chen, Y.-C. (2015, November). *Discourse Trajectories in Elementary Classrooms: Using Critique to Facilitate Scientific Arguments.* Faculty Spotlight Seminar Series, Mary Lou Fulton Teachers College, Arizona State University, Tempe, AZ.
   Attendees: 20

PATENTS

United States of America

1. Lee, C.-H., Lee, S.-G., **Chen, Y.-C.**, & Wu, C.-S. (2009). *Optical interconnection module.* U.S. Patent No. 7630594. Washington, D.C.: U.S. Patent and Trademark Office.
2. Lu, C.-C., Lee, S.-G., Lee, C-H., Lee, S.-T., & **Chen, Y.-C.** (2009). *Hybrid electro-optical circuit board and method for fabricating the same.* U.S. Patent No. 7577321. Washington, D.C.: U.S. Patent and Trademark Office.
3. Wu, C.-S., Chiu, H.-H., Lee, S.-G., & **Chen, Y.-C.** (2007). *Electro-optical circuit board.* U.S. Patent No. 7295725. Washington, D.C.: U.S. Patent and Trademark Office.
4. Chen, Y.-M., **Chen, Y.-C.**, Cheng, Y.-L., & Lee, S.-T. (2007). *Array optical sub-assembly.* Patent No. 7249896. Washington, D.C.: U.S. Patent and Trademark Office.
5. Chu, Y., **Chen, Y.-C.**, & Lee, S.-T. (2007). *Optoelectric converting substrate.* Patent No. 7212702. Washington, D.C.: U.S. Patent and Trademark Office.

Taiwan

1. Lee, C.-H., Lee, S.-G., **Chen, Y.-C.**, & Wu, C.-S. (2009). *Optical interconnection module.* R.O.C. Patent No. I317030. Taipei: Taiwan Patent and Trademark Office.
2. Lu, C.-C., Lee, S.-G., Lee, C-H., Lee, S.-T., & **Chen, Y.-C.** (2009). *Hybrid electro-optical circuit board and method for fabricating the same.* R.O.C. Patent No. I308228. Taipei: Taiwan Patent and Trademark Office
3. Wu, C.-S., Chiu, H.-H., Lee, S.-G., & **Chen, Y.-C.** (2009). *Optical-electrical circuit board.* R.O.C. Patent No. I306519. Taipei: Taiwan Patent and Trademark Office.
4. **Chen, Y.-C.**, Chu, Y., Lee, S.-T., Tien, P., & Hsu, K.-Y. (2007). *Optoelectric converting substrate.* R.O.C. Patent No. I272880. Taipei: Taiwan Patent and Trademark Office.
5. Chen, Y.-M., **Chen, Y.-C.**, Cheng, Y.-L., & Lee, S.-T. (2006). *Array optical sub-assembly.* R.O.C. Patent No. I247152. Taipei: Taiwan Patent and Trademark Office.
6. Chu, M.-T., Wu, W.-C., Cheng, Y.-J., **Chen, Y.-C.**, Lee, C.-H., & Chen, C.-L. (2003). *Butterfly package module.* R.O.C. Patent No. 562341. Taipei: Taiwan Patent and Trademark Office.

China

1. Lu, C.-C., Lee, S.-G., Lee, C-H., Lee, S.-T., & **Chen, Y.-C.** (2008). *Hybrid electro-*

optical circuit board and method for fabricating the same. P.R.C. Patent No. CN101206287. Beijing: China Patent and Trademark Office.
2. Wu, C.-S., Chiu, H.-H., Lee, S.-G., & **Chen, Y.-C.** (2008). *Optical-electrical circuit board.* P.R.C. Patent No. CN101178461. Beijing: China Patent and Trademark Office.
3. **Chen, Y.-C.**, Chu, Y., Lee, S.-T., Tien, P., & Hsu, K.-Y. (2008). *Optoelectric converting substrate.* P.R.C. Patent No. CN1955767. Beijing: China Patent and Trademark Office.

EDUCATIONAL RESEARCH EXPERIENCE

External Funding

Principle Investigator: Managing Uncertainty for Productive Struggle: Exploring Teacher Development for Managing Students' Epistemic Uncertainty as a Pedagogical Resource in Project-Based Learning, sponsored by National Science Foundation, executed by Arizona State University, 8/1/2021 - 7/31/2024, $442,293
Award Number (FAIN): 2100879

Co-Principle Investigator: EAGER: SaTC-EDU: Artificial Intelligence for Cybersecurity Education via a Machine Learning-Enabled Security Knowledge Graph, PI: Stephen Krause, sponsored by National Science Foundation, executed by Arizona State University, 5/1/2021-4/30/2023, $300,000
Award Number (FAIN): 2114789

Co-Principle Investigator: Scaling a Cyber-Enabled JIT-Teaching with Two-Way Formative Feedback (JTF) Project From the Individual Faculty Level to the Disciplinary Department level, PI: Stephen Krause, sponsored by National Science Foundation, executed by Arizona State University, 9/1/2015 - 8/31/2019, $ 1,999,987
Award Number (FAIN): 1524527

- instruction informed by a two-way frequent formative feedback loops from Student muddiest point feedback and instructor next-class responses
- scaled to 84 faculty in 7 engineering disciplines

Investigator: Engineering to Transform the Education of Analysis, Measurement, and Science in a Team-Based Targeted Mathematics-Science Partnership, PI: Tamara Moore, sponsored by National Science Foundation, executed by University of Minnesota, 1/1/2013 -12/31/2017, $3,413,681.
Award Number (FAIN): 1238140

-Designed engineering curriculum embedded with argumentation for grades 4- 8, given the spiraling nature of the science content in these grades
-Provided professional development on effective practices, constructivist teaching, design-based instruction, inquiry, and argumentation to be used in science instruction

-Providing cognitive and content coaching on how to implement both the curriculum and the pedagogies

Investigator: Linking Cognitive Science, Measurement Theory and Evaluation Approaches to Assess Development of Scientific Reasoning--Cognition, Measurement and Evaluation (CME) project, PI: Frances Lawrenz, sponsored by National Science Foundation, executed by University of Minnesota,10/01/2011 - 7/31/2013, $234,232.
Award Number (FAIN): 1118433

-Designed and analyzed assessment devices for scientific reasoning that can be used across age ranges from fifth grade through college in different classroom settings to allow within and across program analyses

Research Assistant: Efficacy of the Science Writing Heuristic (SWH) Approach, PI: Brian Hand, sponsored by Institute for Educational Studies, executed by University of Iowa, 6/1/2009-6/31/2012, $4,850,000.
Award Number: R305A090094

-Aided grades 4-8 science teachers in development of strategies and orientation toward teaching, learning and literacy in their science classrooms with the use of Science Writing Heuristic (SWH) approach
-Collected data from teachers' practice and discussed their progression and teaching difficulties
-Analyzed data using the Reformed Teacher Observation Protocol (RTOP)

Research Assistant: When Science and Literacy Meet: Creating Support for Teachers Implementing Writing in the Science Classroom, PI: Brian Hand, sponsored by National Science Foundation, executed by University of Iowa, 1/1/ 2005-1/1/2008, $ 1,497,405.
Award Number (FAIN): 0537035

-Evaluated and discussed teaching practicing in over 30 science classrooms at grade 2-8 level by using the Reformed Teacher Observation Protocol (RTOP)
-Helped those teachers who participated the professional development program used argument-based inquiry, known as Science Writing Heuristic (SWH), in their classrooms
teachers' PCK in order to help teacher develop sophisticated PCK.

Research Assistant: Learners' Scientific Information Commitments and Their Searching Strategies in Internet-Based Learning Environment, PI: Chin-Chung Tsai, sponsored by Taiwan National Science Foundation, executed by National Taiwan University of Science and Technology, Taiwan, 2006 – 2007, $650,000 (New Taiwan Dollars)

-Designed on-line peer assessment activity, collected data, and discussed with in-service elementary science teachers about how to apply technology in their

classrooms
-Analyzed data using ANOVA and correlation methods

Internal Funding

Principal Investigator: Seed Grant: Productively managing students' epistemic uncertainty to develop collective knowledge in argumentative science classrooms, sponsored by Institute for Social Science Research, Arizona State University, 6/1/2020-5/31/2021, $7,067.

-work with five science teachers at high school levels to design curriculum by imbedding student epistemic uncertainty in their lessons
-identified productive strategies in using student s' epistemic uncertainty for productive struggles to develop scientific knowledge

Principal Investigator: Productive Management of Uncertainty: Supporting Science Teachers to Raise, Maintain, and Reduce Uncertainty toward Student Conceptual Development in Argumentation, sponsored by Mary Lou Fulton Teachers College, Arizona State University, 7/1/2018-6/30/2019, $14,873.

-collaborated with five physics teachers at high school levels to design curriculum guided by Science Talk Writing Heuristic (STWH) approach
-identified cognitive and social resources used for managing uncertainty to developed scientific knowledge in the unit of force and motion

Principal Investigator: Seed Grant: Supporting Teachers' Pedagogical Content Knowledge (PCK) of Argumentation in Middle School Science Classrooms, sponsored by Institute for Social Science Research, Arizona State University, 1/1/2018-6/31/2018, $4,000.

-unpacked middle school science teachers' PCK for argumentation
-examined how middle school science teachers engage students in management uncertainty during argumentative practice

Principal Investigator: Seed Grant: Supporting Middle School Teachers to Implement Argumentation in Science Classrooms, sponsored by Institute for Social Science Research, Arizona State University, 6/1/2017-12/31/2017, $6,971.

- designed argument-based inquiry curriculum for middle school at sixth grade
- examined the difficulties and progression of middle school science teachers' implementation of argument-based inquiry curriculum

Principal Investigator: Supporting Preservice Teachers to Implement Argumentation, sponsored by Mary Lou Fulton Teachers College, Arizona State University, 1/1/2017-12/31/2017, $12,900.

- identified essential components of PCK for argumentation
- tracked trajectory of PCK development for argumentation

- unpacked the relationship between teachers' PCK and student learning

Principal Investigator: Exploring Argumentative Practices from Both Perspectives of Epistemic Understanding and Social Negotiation, sponsored by Mary Lou Fulton Teachers College, Arizona State University, 5/1/2015-12/31/2015, $10,000.

-Conducted data analyses of students' discussion and writing from a fifth- grade classroom

-Wrote three articles based on the data analyses

Principal Investigator: Constructing and Critiquing Arguments in School Science Classrooms, sponsored by College of Education and Human Development, University of Minnesota, 5/20/2013-6/1/2014, $5,000.

-Developed a model set of argument-based curriculum materials responding to the *Next Generation Science Standards* and *Common Core States Standards* to support teachers' implementation of teaching argumentation, instantiated within sixth- grade science curriculum

-Investigated the relationship between teachers' pedagogical content knowledge (PCK) for argumentation and their instructional practices

Research Assistant: Developing Measures of Teachers' Pedagogical Content Knowledge for Teaching High School Biology, Sponsored by The Iowa Measurement Research Foundation, The University of Iowa, 8/1/2007- 12/31/2008, $32,206.

-Made classroom observations in grade 8-12 classrooms, videotaped four biology classes, and interviewed four teachers.

-Developed measures and a rubric to evaluate

Unfunded grants

2021

National Science Foundation, Discovery Research K-12 program ($1,499,997 proposed by Arizona State University for five years, collaborative research with University of Iowa and University Alabama)

Principal Investigator

Study: Collaborative Research: Scaling Up for Sustainability: Moving Beyond Replication

2019

National Science Foundation, Discovery Research K-12 program ($450,000 for three years)

Principal Investigator

Study: SUPR: Exploring the Effects of Teacher Professional Development in Managing Students' Epistemic Uncertainty as a Pedagogical Resource in Science Classrooms

2019
National Academy of Education/ Spencer Foundation, small grant ($49,995 for two years)
Principal Investigator
Study: Productively Managing Students' Epistemic Uncertainty in Argumentative Science Classrooms
2018
National Academy of Education/ Spencer Foundation, small grant ($49,993 for two years)
Principal Investigator
Study: Managing Uncertainty in Scientific Argumentation: The Nexus of Teacher Knowledge for and in Practice and Students' Conceptual Understanding
2017
National Science Foundation, CAREER program ($666,810.00 for five years)
Principal Investigator
Study: Supporting Teachers' Pedagogical Content Knowledge (PCK) of Argumentation in Elementary Science Classrooms
2016
National Science Foundation, CAREER program ($613,893.00 for five years)
Principal Investigator
Study: Supporting Argumentation in Elementary Science Classrooms
2016
National Academy of Education/Spencer Foundation, Postdoctoral Fellowship Program ($70,00.00 with no service and teaching load for one years)
Principal Investigator
Study: Differentiating Talk and Writing Activities for Effective Scientific Argumentation
2016
The Chiang Ching-kuo Foundation for International Scholarly Exchange ($125,000 for three years)
Co-Principal Investigator (Submitting Institution: National Taiwan University of Science and Technology; PI: Chin-Chung Tsai)
Study: Differentiating Talk and Writing Activities for Student Learning in Physics
2016
National Science Foundation, IUSE program ($297,389 for three years)
Co-Principal Investigator (Submitting Institution: California Polytechnic State University Foundation; PI: Dr. Yiwen Chiu)
Study: Quantifying Sustainability: Adapting the Science Writing Heuristic Approach to Improve Teaching and Learning Efficiency in Environmental and Agricultural Sciences
2015
National Science Foundation, CAREER program ($586,229.00 for five years)
Principal Investigator

Study: Argumentation for all students (A4All): Immersing Students in Learning Science, Literacy, and Language through Argument-Based Inquiry

2015

National Science Foundation (National Science Foundation, $249,867.00 for two years)
Co- Principal Investigator (PI: Dr. Joseph Henderson; Co-PI: Audrey Beardsley, Auriane Koster, and Eugene Judson)
Study: DiALoG: Developing A Practical Instrument for Instructors to Assess Verbal Classroom Argumentation in Real Time

TEACHING EXPERIENCE

Instructor: TEL 702 Dynamic Contexts of Education — Fall 2021-present

Mary Lou Fulton Teachers College, Arizona State University (Online, 3hr/ each week)

-Revised instruction for and taught online class for first year of EdD students

Instructor: DCI 691 Transdisciplinary Seminar — Fall 2020, Spring 2021

Mary Lou Fulton Teachers College, Arizona State University (synchronous, 3hr/ each week)

-Designed instruction for and taught online class for first year of PhD students

Instructor: SCN 400 & SCN 401 Sustainability for Science Teacher — Spring 2017-present

Mary Lou Fulton Teachers College, Arizona State University (Hybrid, 3hr/ each week)

Instructor: SED 482 Science Teaching Methods — Fall 2016-present

Mary Lou Fulton Teachers College, Arizona State University (3hr/ each week)

-Designed instruction for and taught class for pre-service science teachers at secondary level
-Advised lesson plans for teaching in school sites
-Supervised student teaching

Instructor: SED 111 Exploration Science Teaching — Fall 2016

Mary Lou Fulton Teachers College, Arizona State University (1hr/ each week)

-Introduced innovative teaching strategies and the Nature of Science (NOS) for pre-service science teachers at secondary level

Instructor: EED 411 Science in Elementary Schools — Fall 2014-present

Mary Lou Fulton Teachers College, Arizona State University (3hr/ each week)

-Designed instruction for and taught class for pre-service science teachers at elementary level
-Advised lesson plans for teaching in school sites

-Supervised student teaching

Instructor: CI 5502 Science Instruction in the Elementary Grades Spring 2013
Department of Curriculum and Instruction, University of Minnesota (3hr/each week)
-Designed instruction for and taught class for pre-service science teachers at elementary level
-Advised lesson plans for teaching in school sites
-Supervised student teaching

Supervisor: Teaching Science in the Elementary and Middle Schools (Grade4-8) Fall 2013-Spring 2014
Department of Curriculum and Instruction, University of Minnesota (3hr/each week)
-Advised elementary and middle school science teachers about teaching strategies, curriculum design, lesson plans about engineering-based inquiry
-Consultant for the science content
-Observed and assisted elementary and middle science teachers with engineering activities

Instructor: After-school Program in the Secondary Grades 2012-2013
Minneapolis Community Education (African American and Latino communities), Columbia Hights, Minnesota (4.5hr/each month)
-Designed instruction for and taught engineering class for upper level elementary students

Co-instructor: CI 5502 Science Instruction in the Elementary Grades 2011-2012
Department of Curriculum and Instruction, University of Minnesota (3hr/each week)
-Designed instruction and taught for pre-service science teachers at elementary level

Teaching Assistant: 07E:162:001 Methods Elementary School Science 2010-2011
Department of Teaching and Learning, University of Iowa (3hr/ each week)
-Designed instruction for and taught class for pre-service science teachers at elementary level
-Assisted professor in the grading of lecture exams
-Supervised student teaching

Supervisor: Teaching Science in the Elementary and Middle Schools (Grade3-8) 2010-2011
Waterloo Elementary School District (more than 40 % students are African American), Waterloo, Iowa (10hr/ each week)
-Advised elementary and middle school science teachers about teaching strategies, curriculum design, lesson plans, and students' difficulties with argument-based inquiry
-Consultant for the science content

-Observed and assisted elementary and middle science teachers with inquiry activities

Teaching Assistant: Philosophy of Science (Graduate School) 2006-2007
Graduate Institute of Digital Learning and Education, National Taiwan University of Science and Technology, Taiwan (3hr/ each week)
-Designed instruction for graduate classes focused on the connection between theory and practical teaching
-Graded students' final reports

Teaching Assistant: Constructivism Applied in Science Education (Graduate School) 2006-2007
Graduate Institute of Digital Learning and Education, National Taiwan University of Science and Technology, Taiwan (3hr/ each week)
-Designed instruction for graduate classes focused on the connection between theory and practical teaching
-Graded students' final reports

Instructor: Applied Physics / Opto-electrical Package (Graduate School) 2002-2006
Industrial Technology Research Institute, Taiwan (2hr/ each week)
-Designed instruction for graduate classes focused on the connection between theory and practical teaching
-Graded students' final reports

Internship: Physics/ Mechanical Engineering (Grade 8) 1999-2001
St. Aloysius Technical School, Taiwan
-Designed and taught curriculum of physics, statics, and Kinetics for eighth graders

Instructor: Material Testing Laboratory (Undergraduate) 2000-2001
Department of Mechanical Engineering, National Chiao Tung University, Taiwan (2hr/each week)
-Taught undergraduate class associated to material testing laboratory
-Graded students' written reports

ADVISEES, MENTEES, AND STUDENTS' COMMITTEES

Doctoral (PhD)

Major Doctoral Research Supervisor

1. Jongchan Park — Fall 2021-present
-Develop a survey to access students' perceptions and strategies for managing uncertainty in project-based learning
2. Takeshi Terada — Fall 2019-Summer 2021
-Validate observation protocol to evaluating science teachers' teaching based on ICAP framework and NGSS

3. Catherine Cullicott — Fall 2017-
   -Identify resources of uncertainty management in argumentation — Spring 2019

Secondary Doctoral Research Supervisor

1. Takeshi Terada — Spring 2018-
   -Validate observation protocol to evaluating science teachers' teaching based on ICAP framework and NGSS — Spring 2019
2. Ratrapee Techawitthayachinda — Spring 2018-
   -Frame productive moment of uncertainty in argumentation — Spring 2019
3. Xue Qiao — Fall 2016-
   -Unpack epistemic engagement of an argument as a resource to manage uncertainty — Winter 2017

Doctoral (EdD)

Raquel Alvara, Jennifer Bevins, Steven Flanagan, Nicole Mason, Chonsey Pogue, Andrew Ross, and Kristopher Seydel — Fall 2020-present
(expected to graduate in Spring 2022)

Completed and Graduated

P**hD**

1. Takeshi Terada — Spring 2018-
   -Predictive utility of a proficiency cut score in a benchmark assessment — July 2021

EdD

1. Gina Delgado — Fall 2018-
   - Using social presence to create student connections in an online graduate program — May 2020
1. Dude Coudret — Fall 2018-
   - Turning the spotlight on shame: fostering adaptive responses to feelings of academic shame in medical students — May 2020
2. Caitlin Meaney — Fall 2018-
   -Fostering relational competency among teachers in early care and education: a strategy to prevent expulsion — May 2020
3. Junior Michael — Fall 2018-
   - Black Males' Perceptions of Their Teachers' Curricular Expectations in Culturally Sustaining Mathematics Classrooms — May 2020
4. Jennifer O'Brien — Fall 2018-
   - University club advising: Learning and connecting through formal practices — May 2020
5. Catherine-Ann LaRoche — Fall 2018-

- Utilizing an online platform in disseminating information about housing renewal to residential students in their second year and beyond — May 2020

6. Robert Schoenfeld — Fall 2018-
   -Improving self-efficacy of faculty on communicating with international students — May 2020

Undergraduate

1. Melinda Hickcox (Honor contract). Science talk writing heuristic approach. — 2017
2. Carson Harris (Chair). Dancing through physics. — 2017
3. Alexia Rudolph (Second reader). Student use of and attitudes toward the textbook in an introductory biology course. — 2016
4. Lindsey Mineweaser (Honor contract). Modeling the nature of science to inquiry. — 2016

HONORS, AWARDS, AND FELLOWSHIPS

1. NARST Early Career Research Award, National Association for Research in Science Teaching (NARST) — 2017
   https://narst.org/awards/early-career-research-award
2. Association of American Publishers (AAP) Revere award, National Science Teacher Association (NSTA) — 2015
   http://nstacommunities.org/blog/2015/05/14/explore-outstanding-educational-resources-2015-revere-awards-finalists/
3. Faculty Research Award, Arizona State University ($10,000.) — 2015
4. NARST Outstanding Paper Award, National Association for Research in Science Teaching (NARST) — 2014
   https://narst.org/awards/outstanding-paper-award
5. Jhumki Basu Equity Scholars Award, National Association for Research in Science Teaching (NARST) ($700.) — 2014
6. Faculty and Staff Research Award, University of Minnesota ($5, 000.) — 2013
7. International Travel Grant Award, University of Minnesota ($1,500.) — 2012
8. Graduate College Dissertation Fellowships, University of Iowa ($3,000.) — 2011
9. Teaching and Learning Accomplishment Scholarships, University of Iowa ($1,000.) — 2010
10. Franklin D. Stone International Student Award, University of Iowa ($ 1,000.) — 2008-2011
11. Audrey Qualls Travel Award, University of Iowa ($ 400./ each year) — 2008-2011
12. Study Abroad Scholarship, Ministry of Education, Taiwan ($25,000./each year) — 2008-2010
13. Technical Contribution Award (third runner-up), Opto-electronics & Systems Laboratories, Industrial Technology Research Institute, — 2005

Taiwan

14. Excellent Documentation Award (first runner-up), Opto-electronics & Systems Laboratories, Industrial Technology Research Institute, Taiwan — 2004
15. Excellent Documentation Award (third runner-up), Opto-electronics &Systems Laboratories, Industrial Technology Research Institute, Taiwan — 2003

ACADEMIC SERVICE

Associate Editor

Frontier in Education (Section: STEM Education) — 2021

Editorial Advisory Board

International Journal of Science Education	2022-present
International Journal of Mathematics and Science Education	2022-present
Science Education	2021-present

Journal Reviewer

Educational Researcher	2022-present
Psychology Research and Behavior Management	2022-present
Teachers and Teaching: Theory and Practice	2022-present
Journal of Computer Assisted Learning	2022-present
Teaching and Teacher Education	2022-present
Journal of Experimental Education	2022-present
Writing Communication	2022-present
Instructional Science	2022-present
Education Sciences	2021-present
International Journal of Information and Education Technology	2021-present
Education Research International	2021-present
Research in Science & Technological Education	2021-present
AERA Open	2021-present
Canadian Journal of Science, Mathematics, and Technology Education	2021-present
Innovative Teaching and Learning	2021-present
Frontier in Education (Section: STEM Education, Educational Psychology)	2020-present
Asia Pacific Education Review	2020-present
The Modern Language Journal	2020-present
Journal of Education in Science, Environment and Health	2020-present
Chemistry Education Research and Practice	2020-present
Disciplinary and Interdisciplinary Science Education Research	2019-present
Classroom Discourse	2019-present
The Science Teacher	2019-present

EURASIA Journal of Mathematics, Science & Technology Education	2019-present
Journal of Research in Childhood Education	2018-present
Learning: Research and Practice	2018-present
International Journal of Early Years Education	2018-present
International Journal of Research in Education and Science	2018-present
Journal of Research in Science Teaching	2017-present
International Journal of Science Education	2017-present
Computer & Education	2017-present
Asia Pacific Journal of Education	2017-present
Contemporary Educational Psychology	2016-present
Science & Education	2016-present
International Journal of Science and Mathematics Education	2016-present
Linguistics and Education	2015-present
Research in Science Education	2015-present
The American Biology Teacher	2015-present
Science Education	2014-present
Journal of the Learning Sciences	2013-present
Science Activities	2013

Conference Proposal Reviewer

American Educational Research Association (AERA) (Division C: Science; Division K: PK-12 STEM)	2011-present
Association of Science Teacher Education International Conference (ASTE)	2010-present
International Conference of the Learning Sciences (ICLS)	2012-present
National Association for Research in Science Teaching (NARST) (Strand 1, 2, 3, 4, 8)	2009-present

Professional Institution Proposal Review

National Science Foundation (NSF)	2018-present
-Review Panel for DRK-12 Program, CAREER program	
European Science Education Research Association (ESERA)	2018-present
-Summer School	
National Association for Research in Science Teaching (NARST)	2017
-Pre-workshop	

External reviewer for tenure and promotion for the following institutions

George Washington University	2021

Membership in Professional Societies

National Association for Research in Science Teaching (NARST)
-appointed to research committee 2016-2019
American Educational Research Association (AERA)
Association of Science Teacher Education International Conference (ASTE)
European Science Education Research Association (ESERA)

International Society of the Learning Sciences (ISLS)
National Association of Biology Teachers (NABT)

Services within University

Search committee for the position of clinical assistant professor in science education	2022
Chair of Curriculum Review Committee (CRC) of MLFTC	2021-2022
Course coordinator for SCN 401 Sustainability for Science Teacher	2021-present
Committee for EdD in Leadership and Innovation Program of MLFTC	2018-present
Committee for Learning, Literacies, and Technologies (LLT) doctoral program of MLFTC	2018-2021
Committee for Student Issues of MLFTC	2017-2020
Committee for STEM Master Program of MLFTC	2017-2018
Doctoral Course rotation committee for Mary Lou Fulton Teachers College (MLFTC)	2017
Search committee for the position of International Teacher education (open position)	2017-2018