

Hsin-Kai Wu

Curriculum Vitae

National Taiwan Normal University
Graduate Institute of Science Education
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CURRENT POSITION

NTNU Chair Professor

Graduate Institute of Science Education, College of Science
National Taiwan Normal University, Taipei, Taiwan

Visiting Professor

Department of Science and Technology Education, Faculty of Education
University of Johannesburg, South Africa

ACADEMIC BACKGROUND

Ph.D., 2002, University of Michigan

School of Education, Educational Studies—Science Education Program

Dissertation: *Middle School Students' Development of Inscriptional Practices in Inquiry-Based Science Classrooms* (2003 NARST Outstanding Dissertation Award)

Committee: Drs. Joseph S. Krajcik (chair), Elizabeth A. Davis, Priti Shah, and Elliot Soloway

M.S., 1997, National Taiwan Normal University, Taipei, Taiwan

Department of Chemistry

Thesis: *Analysis of Chinese Herb Medicines by Capillary Electrophoresis and High-Performance Liquid Chromatography*

Advisor: Dr. Shuenn-Jyi Sheu

B.S., 1995, National Taiwan Normal University, Taipei, Taiwan

Department of Chemistry

Certification: Department of Education, Taiwan, Teaching Certificate: Grade 10-12 Chemistry

RESEARCH INTERESTS

Inquiry Learning, Early Childhood Science Education, Computer-based Assessment, Learning Technology, Chemistry Education, Multiple Representations.

HONORS AND AWARDS

World's Top 2% Scientists 2020 by Stanford University (career-long and single year impact), 2021

NTNU Chair Professorship, National Taiwan Normal University, Taiwan, 2017-present.

Research Chair Professorship, National Taiwan Normal University, Taiwan, 2010-2013, 2014-2016.

Outstanding Research Award, Ministry of Science and Technology, Taiwan, 2014, 2017.

Distinguished Professorship, National Taiwan Normal University, Taiwan, 2013.

Outstanding Research Award, National Science Council, Taiwan, 2009.

NARST Early Career Research Award, National Association of Research in Science Teaching, USA, 2008.

Outstanding Research Award, National Taiwan Normal University, Taiwan, 2004, 2005, 2006, 2007, 2009, 2014.

Wu Da-Yu Memorial Award (Outstanding Young Researcher Award), National Science Council, Taiwan, 2004.

NARST Outstanding Dissertation Award, National Association of Research in Science Teaching, USA, 2003.

Barbour Scholarship, University of Michigan, USA, 2001-2002.

ACADEMIC EXPERIENCE

2022-2027: Visiting Professor, Department of Science and Technology Education, Faculty of Education, University of Johannesburg, South Africa

2020-2023: Director, Graduate Institute of Science Education, College of Science, National Taiwan Normal University, Taipei, Taiwan

2016-2021: Distinguished Visiting Professor, Department of Science and Technology Education, Faculty of Education, University of Johannesburg, South Africa

2006-2010: Associate Professor, Graduate Institute of Science Education, College of Science, National Taiwan Normal University, Taipei, Taiwan

2008 January-September: Honorary Fellow, Learning Sciences Program, Department of Educational Psychology, University of Wisconsin-Madison, USA.

2003-2006: Assistant Professor, Graduate Institute of Science Education, National Taiwan Normal University, Taipei, Taiwan

2002: Postdoctoral Fellow, School of Education, University of Michigan, Ann Arbor, MI

1997-2002: Graduate Student Research Assistant, School of Education, University of Michigan, Ann Arbor, MI

1995-1997: Graduate Student Research Assistant, Department of Chemistry, National Taiwan Normal University, Taipei, Taiwan

1994-1995: Chemistry Teacher, Lan-Yang Senior High School, I-Lan, Taiwan

PUBLICATIONS

Refereed Journal Articles (* indicates Corresponding Author)

<2023>

- Chen, Y. C., Wu, H.-K.*, & Hsin, C.-T. (2023). A systematic review of assessments for young children's scientific and engineering practices. *Research in Science & Technological Education*. Advance online publication. <https://doi.org/10.1080/02635143.2022.2121693>
- Yang, K. L., Wu, H.-K.*, Yeh, Y. F., Lin, K. Y., Wu, J. Y., & Hsu, Y. S. (2023). Implementers, designers, and disseminators of integrated stem activities: Self-efficacy and commitment. *Research in Science & Technological Education*. Advance online publication. <https://doi.org/10.1080/02635143.2021.2008343>
- Lin, K. Y., Yeh, Y. F.,* Hsu, Y. S., Wu, J. Y., Yang, K. L., & Wu, H.-K. (2023). STEM education goals in the twenty-first century: Teachers' perceptions and experiences. *International Journal of Technology and Design Education*. Advance online publication. <https://doi.org/10.1007/s10798-022-09737-2>
- Hsin, C.-T., Wu, H.-K.*, Liang, J. C., & Luu, D. T. (2023). Factors predicting kindergarten teachers' integration of science into their teaching in indigenous areas. *Australasian Journal of Early Childhood*, 48(1), 50–65. <https://doi.org/10.1177/18369391221120956>
- Hsin, C.-T.* & Wu, H.-K. (2023). Implementing a project-based learning module in urban and indigenous areas to promote young children's scientific practices. *Research in Science Education*, 53(1), 37–57. <https://doi.org/10.1007/s11165-022-10043-z>

<2022>

- Chen, Y. C., Wu, H.-K.*, & Hsin, C.-T. (2022). Science teaching in kindergartens: Factors associated with teachers' self-efficacy and outcome expectations for integrating science into teaching. *International Journal of Science Education*, 44(7), 1044-1066. <https://doi.org/10.1080/09500693.2022.2062800>
- Hung, C.-S. & Wu, H.-K.* (2022). High school science teachers' conceptions about the curriculum of "inquiry and practice": Course characteristics, challenges, teaching goals and activities. *Chinese Journal of Science Education*, 30(1), 1-26. [https://doi.org/10.6173/CJSE.202203_30\(1\).0001](https://doi.org/10.6173/CJSE.202203_30(1).0001)
- Zhang, R. C., Hung, C.-S., & Wu, H.-K.* (2022). Examining the validity and measurement invariance of an assessment literacy inventory for secondary science teachers. *Chinese Journal of Science Education*, 30(4), 309-333. [https://doi.org/10.6173/CJSE.202212_30\(4\).0002](https://doi.org/10.6173/CJSE.202212_30(4).0002)

<2021>

- Ndumanya, E., Ramnarain, U.*, & Wu, H.-K. (2021). An analysis of selected South African grade 12 physical sciences textbooks for the inclusion of the NGSS science practices. *Canadian Journal of Science, Mathematics and Technology Education*, 21, 539-552. <https://doi.org/10.1007/s42330-021-00169-z>

- Lee, S. W.-Y.*, Wu, H.-K., & Chang, H.-Y. (2021). Examining secondary school students' views of model evaluation through an integrated framework of personal epistemology. *Instructional Science*, 49, 223-248. <https://doi.org/10.1007/s11251-021-09534-9>
- Lin, C.-Y., & Wu, H.-K.* (2021). Effects of different ways of using visualizations on high school students' electrochemistry conceptual understanding and motivation towards chemistry learning. *Chemistry Education Research and Practice*, 22, 786-801. <https://doi.org/10.1039/d0rp00308e>
- Ramnarain, U.*, Pieters, A. E., & Wu, H.-K. (2021). Assessing the technological pedagogical content knowledge of pre-service science teachers at a South African university, *International Journal of Information and Communication Technology Education*, 17(3), 123-136. <https://doi.org/10.4018/IJICTE.20210701.oa8>
- Lin, H. H., Kuo, C. Y., & Wu, H.-K.* (2021). Relationship among engagement and curiosity of individual level variables of students, group level variables of teachers, and scientific inquiry abilities: Conference of cross-level moderated mediation, *Journal of Research in Education Sciences*, 66(2), 75-110. [https://doi.org/10.6209/JORIES.202106-66\(2\).0003](https://doi.org/10.6209/JORIES.202106-66(2).0003)
- <2020>
- Chien, S. P. & Wu, H.-K.* (2020). Examining influences of science teachers' practices and beliefs about technology-based assessment on students' performances: A hierarchical linear modeling approach. *Computers & Education*, 157, 10396. <https://doi.org/10.1016/j.compedu.2020.103986>
- Wu, P. H. & Wu, H.-K.* (2020). Constructing a model of engagement in scientific inquiry: Investigating relationships between inquiry-related curiosity, dimensions of engagement, and inquiry abilities. *Instructional Science*, 48, 79-113. <https://doi.org/10.1007/s11251-020-09503-8>
- <2019>
- Anam, R. S., Widodo, A., Sopandi, W. & Wu, H.-K. (2019). Developing a five-tier diagnostic test to identify students' misconceptions in science: an example of the heat transfer concepts. *Elementary Education Online*, 18(3), 1014-1029. <https://doi.org/10.17051/ilkonline.2019.609690>
- Lin, H. H. & Wu, H.-K.* (2019). Validating the standard setting on multimedia-based assessment of scientific inquiry abilities, *Bulletin of Educational Psychology*, 50(3), 473-502. [https://doi.org/10.6251/BEP.201903_50\(3\).0005](https://doi.org/10.6251/BEP.201903_50(3).0005)
- <2018>
- Hung, C.-S. & Wu, H.-K.* (2018). Tenth graders' problem-solving performance, self-efficacy, and perceptions of physics problems with different representational formats. *Physical Review Physics Education Research*, 14(2), 020114-1-17. <https://doi.org/10.1103/PhysRevPhysEducRes.14.020114>
- Wu, P. H., Kuo, C. Y.*, Wu, H.-K., Jen, T. H., & Hsu, Y. S. (2018). Learning benefits of secondary school students' inquiry-related curiosity: A cross-grade comparison of the relationships among learning experiences, curiosity, engagement, and inquiry abilities. *Science Education*, 102(5), 917-950. <https://doi.org/10.1002/sc.21456>
- Chien, S. P., Wu, H.-K.*, & Wu, P. H. (2018). Teachers' beliefs about, attitudes toward, and intention to use technology-based assessments: a structural equation modeling approach.

- EURASIA Journal of Mathematics, Science and Technology Education*, 14(10), em1594.
<https://doi.org/10.29333/ejmste/93379>
- Chang, H.-Y.* , Hsu, Y. S., Wu, H.-K., & Tsai, C. C. (2018). Students' development of socio-scientific reasoning in a mobile augmented reality learning environment. *International Journal of Science Education*, 40(12), 1410-1431.
<https://doi.org/10.1080/09500693.2018.1480075>
- Yang, F. Y., Liu, S. Y., Hsu, C. Y., Chiou, G. L.* , Wu, H.-K., Wu, Y. T., Chen, S., Liang, J. C., Tsai, M. J., Lee, S. W.-Y., Lee, M. H., Lin, C. L., Chu, R. J., & Tsai, C. C. (2018). High school students' epistemic knowledge of science and its relation to learner factors in science learning. *Research in Science Education*, 48(2), 325-344.
<https://doi.org/10.1007/s11165-016-9570-6>
- Lin, H. H., Lin, S. H., & Wu, H.-K.* (2018). Developing and validating a constructed-response assessment of scientific abilities: A case of the optics unit, *Journal of Research in Education Sciences*, 63(1), 173-205. [https://doi.org/10.6209/JORIES.2018.63\(1\).06](https://doi.org/10.6209/JORIES.2018.63(1).06)
- <2017>
- Wang, J.-Y., Wu, H.-K.* , & Hsu, Y. S. (2017). Using mobile applications for learning: Effects of simulation design, visual-motor integration, and spatial ability on high school students' conceptual understanding. *Computers in Human Behavior*, 66, 103-113.
<https://doi.org/10.1016/j.chb.2016.09.032>
- Yeh, Y.-F., Hsu, Y. S.* , Wu, H.-K., & Chien, S. P. (2017). Exploring the structure of TPACK with video-embedded and discipline-focused assessments. *Computers & Education*, 140, 49-64. <https://doi.org/10.1016/j.compedu.2016.10.006>
- Lee, S. W.-Y.* , Chang, H.-Y., & Wu, H.-K. (2017). Students' views of scientific models and modeling: Do representational characteristics of models and students' educational levels matter? *Research in Science Education*, 47, 305-328. <https://doi.org/10.1007/s11165-015-9502-x>
- <2016>
- Chang, H.-Y.* , Hsu, Y. S. & Wu, H.-K. (2016). A comparison study of augmented reality versus interactive simulation technology to support student learning of a socioscientific issue. *Interactive Learning Environments*, 24(6), 1148-1161.
<https://doi.org/10.1080/10494820.2014.961486>
- Fang, S.-C., Hsu, Y. S.* , Chang, H.-Y., Chang, W. H., Wu, H.-K., & Chen, C. M. (2016) Investigating the effects of structured and guided inquiry on students' development of conceptual knowledge and inquiry abilities: A case study in Taiwan. *International Journal of Science Education*, 38(12), 1945-1971.
<https://doi.org/10.1080/09500693.2016.1220688>
- Jen, T.-H., Yeh, Y.-F.* , Hsu, Y. S., Wu, H.-K., & Chen, K. M. (2016). Science teachers' TPACK-Practical: Standard-setting using an evidence-based approach. *Computers & Education*, 95, 45-62. <https://doi.org/10.1016/j.compedu.2015.12.009>
- Hsu, Y. S.* , Fang, S.-C., Zhang, W.-X., Wu, H.-K., Wu, P. H., Hwang, F.-K. (2016). Identifying effective design features of technology-infused inquiry learning modules: A two-year study of students' inquiry abilities. *Educational Technology & Society*, 19(2), 228-244.

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- Wu, H.-K.*, Kuo, C. Y., Jen, T.-H., & Hsu, Y. S. (2015). What makes an item more difficult? Effects of modality and type of visual information in a computer-based assessment of scientific inquiry abilities. *Computers & Education*, 85, 35-48.
<https://doi.org/10.1016/j.compedu.2015.01.007>
- Kuo, C. Y., Wu, H.-K.*, Jen, T. H., & Hsu, Y. S. (2015). Development and validation of a multimedia-based assessment of scientific inquiry abilities. *International Journal of Science Education*, 37(14), 2326-2357. <https://doi.org/10.1080/09500693.2015.1078521>
- Wu, P. H., Wu, H.-K.*, Kuo, C. Y. & Hsu, Y. S. (2015). Supporting scientific modeling practices in atmospheric sciences: Intended and actual affordances of a computer-based modeling tool. *Interactive Learning Environments*, 23(6), 748-765.
<https://doi.org/10.1080/10494820.2013.807844>
- Wang, J.-Y., Wu, H.-K.*, Chien, S. P., Hwang, F. K., & Hsu, Y. S. (2015). Designing Apps for science learning: Facilitating high school students' conceptual understanding by using tablet PCs. *Journal of Educational Computing Research*, 51(4), 441-458.
<https://doi.org/10.2190/EC.51.4.d>
- Chang, H.-Y., Wang, C. Y., Lee, M. H., Wu, H.-K., Liang, J. C., Lee, S. W.-Y., Chiou, G. L., Lo, H. C., Lin, J. W., Hsu, C. Y., Wu, Y. T., Chen, S., Hwang, F. K., & Tsai, C. C.* (2015). A review of features of technology-supported learning environments based on participants' perceptions. *Computers in Human Behavior*, 53, 223-237.
<https://doi.org/10.1016/j.chb.2015.06.042>
- Yeh, Y.-F, Lin, T.-C., Hsu, Y. S.*, Wu, H.-K., & Hwang, F.-K. (2015). Science teachers' proficiency levels and patterns of TPACK in a practical context. *Journal of Science Education and Technology*, 24(1), 78-90. <https://doi.org/10.1007/s10956-014-9523-7>
- <2014>
- Wu, P. H., Wu, H.-K. *, & Hsu, Y. S. (2014). Establishing the criterion-related, construct, and content validities of a simulation-based assessment of inquiry abilities. *International Journal of Science Education*, 36(9-10), 1630-1650.
<https://doi.org/10.1080/09500693.2013.871660>
- Chien, S. P., Wu, H.-K.*, & Hsu, Y. S. (2014). An investigation of teachers' beliefs and their use of technology-based assessments. *Computers in Human Behavior*, 31, 198-210.
<https://doi.org/10.1016/j.chb.2013.10.037>
- Wang, C. Y.*, Wu, H.-K., Lee, S. W.-Y., Hwang, F. K., Chang, H.-Y., Wu, Y.-T., Chiou, G. L., Chen, S., Liang, J.-C., Lin J.-W., Lo, H.-C., & Tsai, C. C. (2014). A review of research on technology-assisted school science laboratories. *Educational Technology & Society*, 17(2), 307-320.
- Eshach, H.*, Wu, H.-K., Hwang, F. K., & Hsu, Y. S. (2014). Whole class dialogic discussion meets Taiwan's physics teachers: Attitudes and culture. *Journal of Science Education and Technology*, 23(1), 183-197. <https://doi.org/10.1007/s10956-013-9462-8>
- Yeh, Y.-F., Hsu, Y. S.*, Wu, H.-K., Hwang, F. K., & Lin, T. C. (2014). Developing and validating technological pedagogical content knowledge-practical (TPACK-Practical) through the Delphi Survey Technique. *British Journal of Educational Technology*, 45(4), 707-722. <https://doi.org/10.1111/bjet.12078>

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- Wu, H.-K.*, Wu, P. H., Zhang, W. X., & Hsu, Y. S. (2013). Investigating college and graduate students' multivariable reasoning in computational modeling. *Science Education*, 97, 337-366. <https://doi.org/10.1002/sce.21056>
- Wu, H.-K.*, Lin, Y. F. & Hsu, Y. S. (2013). Effects of representation sequences and spatial ability on students' scientific understandings about the mechanism of breathing. *Instructional Science*, 41(3), 555-573. <https://doi.org/10.1007/s11251-012-9244-3>
- Wu, H.-K.*, Lee, S. W.-Y., Chang, H.-Y., & Liang, J.-C. (2013). Current status, opportunities and challenges of augmented reality in education. *Computers & Education*, 62, 41-49. <https://doi.org/10.1016/j.compedu.2012.10.024>
- Kuo, C. Y. & Wu, H.-K.* (2013). Toward an integrated model for designing assessment systems: An analysis of the current status of computer-based assessments in science. *Computers & Education*, 68, 388-403. <https://doi.org/10.1016/j.compedu.2013.06.002>
- Chang, H.-Y.*, Wu, H.-K., & Hsu, Y. S. (2013). Integrating a mobile augmented reality activity to contextualize student learning of a socioscientific issue. *British Journal of Educational Technology*, 44(3), E95-E99. <https://doi.org/10.1111/j.1467-8535.2012.01379.x>
- Eshach, H.*, Hwang, F. K., Wu, H.-K., & Hsu, Y. S. (2013). Introducing Taiwanese undergraduate students to the nature of science through Nobel Prize stories. *Physical Review Special Topics-Physics Education Research*, 9(1), 010116-1-15. <https://doi.org/10.1103/PhysRevSTPER.9.010116>

<2012>

- Wu, H.-K.* & Puntambekar, S. (2012). Pedagogical affordances of multiple external representations in scientific processes. *Journal of Science Education and Technology*, 21(6), 754-767. <https://doi.org/10.1007/s10956-011-9363-7>
- Hsu, Y. S.*, Lin, L. F., Wu, H.-K., Lee, D. Y., & Hwang, F. K. (2012). A novice-expert study of modeling skills and knowledge structures about air quality. *Journal of Science Education and Technology*, 21(5), 588-606. <https://doi.org/10.1007/s10956-011-9349-5>
- Chen, S., Lo, H.-C., Lin J.-W., Liang, J.-C., Chang, H.-Y., Hwang, F. K., Chiou, G. L., Wu, Y.-T., Lee, S. W.-Y., Wu, H.-K., Wang, C. Y., & Tsai, C. C.* (2012). Development and implications of technology in reform-based physics laboratories. *Physical Review Special Topics-Physics Education Research*, 8(2), 020113-1-12. <https://doi.org/10.1103/PhysRevSTPER.8.020113>

<2011>

- Wu, H.-K.*, & Wu, C. L. (2011). Exploring the development of fifth graders' practical epistemologies and explanation skills in inquiry-based learning classrooms. *Research in Science Education*, 41(3), 319-340. <https://doi.org/10.1007/s11165-010-9167-4>
- Hsin, C.-T. & Wu, H.-K.* (2011). Using scaffolding strategies to promote young children's scientific understandings of floating and sinking. *Journal of Science Education and Technology*, 20(5), 656-666. <https://doi.org/10.1007/s10956-011-9310-7>

<2006-2010>

- Wu, H.-K.*, Hsu, Y. S., & Hwang, F. K. (2010). Designing a technology-enhanced learning environment to support scientific modeling. *Turkish Online Journal of Educational Technology*, 9(4), 58-65.

- Wu, H.-K. (2010). Modeling a complex system: Using novice-expert analysis for developing an effective technology-enhanced learning environment. *International Journal of Science Education*, 32(2), 195-219. <https://doi.org/10.1080/09500690802478077>
- Wu, H.-K.*, Hsu, Y. S., & Hwang, F. K. (2008). Factors affecting teachers' adoption of technology in classrooms: Does school size matter? *International Journal of Science and Mathematics Education*, 6(1), 63-85. <https://doi.org/10.1007/s10763-006-9061-8>
- Wu, H.-K.*, & Huang, Y.-L. (2007). Ninth grade student engagement in teacher-centered and student-centered technology-enhanced learning environments. *Science Education*, 91(5), 727-749. <https://doi.org/10.1002/sce.20216>
- Hsu, Y. S.*, Wu, H.-K., & Hwang, F. K. (2007). Factors influencing junior high school teachers' computer-based instructional practices regarding their instructional evolution stages. *Educational Technology & Society*, 10(4), 118-130.
- Wu, H.-K.*, & Krajcik, J. S. (2006a). Inscriptional practices in two inquiry-based classrooms: A case study of seventh graders' use of data tables and graphs. *Journal of Research in Science Teaching*, 43(1), 63-95. <https://doi.org/10.1002/tea.20092> (Also appeared in the first JRST virtual issue: Research Informing Practice, August 2010)
- Wu, H.-K.*, & Krajcik, J. S. (2006b). Exploring middle school students' use of inscriptions in project-based science classrooms. *Science Education*, 90(5), 852-873. <https://doi.org/10.1002/sce.20154>
- Wu, H.-K.*, & Hsieh, C. E. (2006). Developing sixth graders' inquiry skills to construct scientific explanations in inquiry-based learning environments. *International Journal of Science Education*, 28(11), 1289-1313. <https://doi.org/10.1080/09500690600621035>
- <2001-2005>
- Wu, H.-K.*, & Shah, P. (2004). Exploring visuospatial thinking in chemistry learning. *Science Education*, 88(3), 465-492. <https://doi.org/10.1002/sce.10126>
- Wu, H.-K. (2003). Linking the microscopic view of chemistry to real life experiences: Intertextuality in a high-school science classroom. *Science Education*, 87(6), 868-891. <https://doi.org/10.1002/sce.10090>
- Singer, J. E.*, Tal, R. T., & Wu, H.-K. (2003). Students' understanding the particular nature of matter. *School Science and Mathematics*, 103(1), 28-44 (equal authorship). <https://doi.org/10.1111/j.1949-8594.2003.tb18111.x>
- Hoffman, J. L., Wu, H.-K.*, Krajcik, J. S., & Soloway, E. (2003). The nature of learners' science content understandings with the use of on-line resources. *Journal of Research in Science Teaching*, 40(3), 323-346. <https://doi.org/10.1002/tea.10079> (Also appeared in *Handbook of Research on New Literacies* (2008) edited by Coiro, J., Knobel, M., Lankshear, C., and Leu, D. J., New York, NY: Routledge)
- Fretz, E. B.*, Wu, H.-K., Zhang, B., Krajcik, J. S., Davis, E. A., & Soloway, E. (2002). An investigation of software scaffolds supporting modeling practices. *Research in Science Education*, 32(4), 567-589. <https://doi.org/10.1023/A:1022400817926> (Also appeared in *Science Education: Major Themes* (2005), edited by Gilbert, J. K., New York, NY: Routledge)
- Wu, H.-K.*, Krajcik, J. S., & Soloway, E. (2001). Promoting conceptual understanding of chemical representations: students' use of a visualization tool in the classroom. *Journal of Research in Science Teaching*, 38(7), 821-842. <https://doi.org/10.1002/tea.1033>

<1995-2000>

- Wu, H.-K., Chuang, W.-C., & Sheu, S.-J.* (1998). Separation of nine iridoids by capillary electrophoresis and high-performance liquid chromatography. *Journal of Chromatography A*, 803, 179-187. [https://doi.org/10.1016/S0021-9673\(97\)01227-2](https://doi.org/10.1016/S0021-9673(97)01227-2)
- Wu, H.-K., & Sheu, S.-J.* (1996). Capillary electrophoretic determination of the constituents of *Paeoniae Radix*. *Journal of Chromatography A*, 753, 139-146. [https://doi.org/10.1016/S0021-9673\(96\)00525-0](https://doi.org/10.1016/S0021-9673(96)00525-0)
- Chuang, W.-C., Wu, H.-K., Sheu, S.-J.*, Chiou, S.-H., Chang, H.-C., & Chen, Y.-P. (1995) A comparative study on commercial samples of Ginseng Radix. *Planta Medica*, 61, 459-465. <https://doi.org/10.1055/s-2006-958137>

Edited Book & Book Chapters

- Hsu, Y. S. & Wu, H.-K. (2015). Development and evaluation of technology-infused learning environments in Taiwan. In M. H. Chiu (Ed.), *Science education research and practices in Taiwan* (pp. 211-232), Singapore: Springer. https://doi.org/10.1007/978-981-287-472-6_11
- Hsu, Y. S., Chang, H.-Y., Fang, S.-C., & Wu, H.-K. (2015). Developing technology-infused inquiry learning modules to promote science learning in Taiwan. In M. S. Khine (Ed.), *Science education in East Asia* (pp. 373-403), Switzerland, Springer. https://doi.org/10.1007/978-3-319-16390-1_15
- Yeh, Y. F., Chien, S.-P., Wu, H.-K., & Hsu, Y. S. (2015). Rubrics of TPACK-P for teaching science with ICTs. In Y. S. Hsu (Ed.), *Development of science teachers' TPACK* (pp. 53-70), Singapore: Springer. https://doi.org/10.1007/978-981-287-441-2_4
- Hsu, Y. S., Yeh, Y. F., & Wu, H.-K. (2015). The TPACK-P framework for science teachers in a practical teaching context. In Y. S. Hsu (Ed.), *Development of science teachers' TPACK* (pp. 17-32), Singapore: Springer. https://doi.org/10.1007/978-981-287-441-2_2
- Chiu, M. H., Tuan, H.-L., Wu, H.-K., Lin, J.-W., & Chou, C.-C. (Eds.). (2013). *Chemistry education and sustainability in the global age*. New York, NY: Springer.
- Chiu, M. H. & Wu, H.-K. (2009). The roles of multimedia in the teaching and learning of the triplet relationship in chemistry. In J. Gilbert & D. Treagust (Eds.) *Multiple representations in chemical education* (pp. 251-283). New York, NY: Springer. https://doi.org/10.1007/978-1-4020-8872-8_12
- Wu, H.-K. (2006). Connecting the microscopic view of chemistry to real life experiences. In L. A. Rex (Ed.) *Discourse of opportunity: How talk in learning situations creates and constrains* (pp. 251-284). Cresskill, NJ: Hampton Press.
- Wu, H.-K. (2003). *Middle School Students' Development of Inscriptional Practices in Inquiry-Based Science Classrooms*, Unpublished Dissertation, University of Michigan, Ann Arbor, Michigan (NARST Outstanding Dissertation Award).

PRESENTATIONS

- Hsin, C.-T., Wu, H.-K., Luu, D. T., & Wei, M.-R. (2023, August 28-September 1). *Fostering young children's scientific practices in urban and indigenous areas: An investigation of instructional strategies*. [Paper presentation]. The biannual conference of the European Science Education Research Association, Cappadocia, Turkey.
- Zhang, R.-C., Hung, C.-S., & Wu, H.-K. (2023, August 28-September 1). *The influence of*

- contextual factors on the assessment practices of high school science teachers.* [Poster presentation]. The biannual conference of the European Science Education Research Association, Cappadocia, Turkey.
- Hung, C.-S. & Wu, H.-K. (2023, August 28-September 1). *High school science teachers' assessment literacy for inquiry-based science instruction.* [Paper presentation]. The biannual conference of the European Science Education Research Association, Cappadocia, Turkey.
- Kayser, C., Penn, M., Ramnarain, U., & Wu, H.-K. (2023, June 24-26). *Measuring inquiry abilities of young learners using a performance-based assessment.* [Paper presentation]. International Conference on Education and New Developments (END), Lisbon, Portugal.
- Hsin, C.-T., Chuang, C.-Y., & Wu, H.-K. (2022, June 28-July 1). *Development of a project-based early STEM module and a teacher workshop integrating biomedical engineering and medical care.* [Paper presentation]. Australasian Science Education Research Association (ASERA) Conference, Perth, Australia.
- Hung, C.-S. & Wu, H.-K. (2022, June 28-July 1). *High school science teachers' conceptions about inquiry teaching in Taiwan: Curriculum challenges, teaching goals and activities.* [Paper presentation]. Australasian Science Education Research Association (ASERA) Conference, Perth, Australia.
- Hsin, C.-T., Wu, H.-K., & Liang, J.-C. (2021, June 30-July 2). *Factors predicting the science teaching practices of kindergarten teachers in Indigenous areas in Taiwan.* [Paper presentation]. Australasian Science Education Research Association (ASERA) Conference, Adelaide, Australia.
- Hsin, C.-T., Luu, D. T., & Wu, H.-K. (2020, November 13-14). *Developing and validating a questionnaire to measure young indigenous children's ethnic identity.* [Paper presentation]. 11th International Conference on Educational Innovation (ICEI), Hsinchu, Taiwan.
- Chien, S. P., Wu, H.-K., & Hsin, C.-T. (2020, June 24-26). *Assessing kindergarteners' scientific inquiry abilities: Development and validation of a performance-based assessment.* [Paper presentation]. Australasian Science Education Conference (online), Wollongong, Australia.
- Hsin, C.-T., Wu, H.-K., & Chien, S. P. (2020, June 24-26). *The development and effects of an inquiry-based early stem curriculum on kindergarteners' science and engineering practices.* [Paper presentation]. Australasian Science Education Conference (online), Wollongong, Australia.
- Hung, C.-S. & Wu, H.-K. (2020, June 24-26). *The relations between epistemic beliefs, metacognition, and self-regulated learning of science learning: A review of studies from 2010 to 2019.* [Paper presentation]. Australasian Science Education Conference (online), Wollongong, Australia.
- Hsin, C.-T., & Wu, H.-K. (2019, September 3-6). *Young indigenous children's performances on a funds of knowledge integrated phonological curriculum in Taiwan.* [Paper presentation]. European Conference on Educational Research (EERA: ECER), Hamburg, Germany.
- Ndumanya, E., Ramnarain, U., & Wu, H.-K. (2019, July 9-11). *Learner-centredness of science practices as depicted in South African Grade 12 Physical Sciences textbooks.* [Paper presentation]. International Council on Education for Teaching (ICET) 63rd World Assembly, Johannesburg, South Africa.
- Penn, M., Ramnarain, U., & Wu, H.-K. (2019, January 15-17). *The relationship between grade*

- 12 learners' understandings about scientific inquiry and achievement in physical sciences.* [Paper presentation]. The 27th Annual Conference of the Southern African Association for Research in Mathematics, Science and Technology Education (SAARSTE), Durban, South Africa.
- Hsin, C.-T., & Wu, H.-K. (2018, September 4-7). *Children's performances on phonological processing skills and teachers' teaching strategies of a bicultural phonics curriculum.* [Paper presentation]. European Conference on Educational Research (EERA: ECER), Bolzano, Italy.
- Ndumanya, E., Ramnarain, U., & Wu, H.-K. (2018, June 23-25). *Developing a rubric for analyzing the inclusion of "scientific practices" in physical sciences textbooks.* [Paper presentation]. International Conference on Education and New Developments (END), Budapest, Hungary.
- Chien, S.-P., Lin, H. H., Wu, H.-K., & Wu, P.-H. (2017, June 27-30). *Examining the impacts of science teachers' practice and beliefs about technology-based assessments on student' performance: A hierarchical linear modeling approach.* [Poster presentation]. Australasian Science Education Conference, Sydney, Australia.
- Lin, H. H., Lin, S. H. & Wu, H.-K. (2017, June 27-30). *Developing and validating a constructed-response assessment of scientific abilities: A case of the optics unit.* [Poster presentation]. Australasian Science Education Conference, Sydney, Australia.
- Wu, H.-K. (2017, June 20). *High school science teachers' conceptions of teaching and assessment for inquiry: Messages from Taiwan.* [Poster presentation]. Gordon Research Conference: Chemistry Education Research & Practice, Bates College, Lewiston, Maine, USA.
- Chang, H.-Y., Yu, Y. T., Wu, H.-K., & Hsu, Y. S. (2016, July 25-28). *The impact of a mobile augmented reality game: changing students' perceptions of the complexity of socioscientific reasoning.* [Paper presentation]. IEEE 16th International Conference on Advanced Learning Technologies, Austin, Texas, USA.
<https://doi.org/10.1109/ICALT.2016.131>
- Hung, C.-S. & Wu, H.-K. (2016, August 26-28). *11th graders' problem-solving performances, self-efficiency and perceptions about physics problems with different representational formats.* [Paper presentation]. International conference of the East-Asian Association for Science Education, Tokyo, Japan.
- Wu, P. H., Kuo, C. Y., Wu, H.-K., Jen, T. H., & Hsu, Y. S. (2015, August 31-September 4). *Effect of science interest on secondary school students' inquiry abilities: A comparison of the structural relationships between engagement and curiosity about inquiry activities.* [Paper presentation]. The biannual conference of the European Science Education Research Association, Helsinki, Finland.
- Kuo, C. Y., Wu, H.-K., Jen, T. H., & Hsu, Y. S. (2015, August 31-September 4). *Analysis of assessment items to describe a learning progression of scientific inquiry.* [Paper presentation]. The biannual conference of the European Science Education Research Association, Helsinki, Finland.
- Zhang, W. X., Hsu, Y. S., Wu, H.-K., Kuo, C. Y., & Jen, T. H. (2015, August 31-September 4). *The effect of metacognition on student inquiry abilities in a simulation-based assessment system.* [Paper presentation]. The biannual conference of the European Science Education Research Association, Helsinki, Finland.
- Yeh, Y.-F., Hsu, Y. S., Wu, H.-K., & Chien, S.-P. (2015, August 31-September 4). *Assessing*

- science teachers' TPACK through video-based questionnaires*. [Poster presentation]. Biannual conference of the European Science Education Research Association, Helsinki, Finland.
- Lee, W. Y. S., Wu, H.-K., & Chang, H. Y. (2015, April 11-14). *Students' views of model evaluation and change of models in different science context*. [Paper presentation]. The annual international conference of the National Association for Research in Science Teaching, Chicago, USA.
- Lee, S. W.-Y., Wu, H.-K., Chang, H.-Y. (2014, November 30- December 4). *Understanding middle and high school students' views of model evaluation and model change*. [Paper presentation]. The 22nd International Conference on Computers in Education, Nara, Japan.
- Chang, H.-Y., Hsu, Y. S., Wu, H.-K., & Chen, C. M. (2014, November 30- December 4). *Path analyses of how students develop conceptual knowledge and inquiry skills in a simulation-based inquiry environment*. [Paper presentation]. The 22nd International Conference on Computers in Education, Nara, Japan.
- Chang, H.-Y., Hsu, Y. S., & Wu, H.-K. (2014, March 30-April 2). *Designing mobile augmented reality and online discussion activities to scaffold students' socioscientific reasoning*. [Paper presentation]. The annual international conference of the National Association for Research in Science Teaching, Pittsburgh, PA.
- Chien, S. P., Wu, H.-K., Hsu, Y. S., & Hwang, F. K. (2013, September 2-7). *An investigation of teachers' beliefs and their use of technology-based assessments*. [Paper presentation]. The biannual conference of the European Science Education Research Association, Nicosia, Cyprus.
- Wu, P. H., Wu, H.-K., Hsu, Y. S., & Hwang, F. K. (2013, September 2-7). *Validation of a simulation-based assessment of inquiry abilities*. [Paper presentation]. The biannual conference of the European Science Education Research Association, Nicosia, Cyprus.
- Hsu, Y. S., Wu, H.-K., Hwang, F. K., Yeh, Y. F., & Chien, S. P. (2012, December 13-15). *The development of an evaluative instrument for teachers' practical technological pedagogical content knowledge*. [Paper presentation]. The International Science Education Conference, Taipei, Taiwan.
- Jen, T. H., Hsu, Y. S., Wu, H.-K., Hwang, F. K., & Yeh, Y. F. (2012, December 13-15). *The development and validation of a survey instrument in TPACK-practical*. [Paper presentation]. The International Science Education Conference, Taipei, Taiwan.
- Kuo, C. Y. & Wu, H.-K. (2012, November 26-30). *The current applications of simulations in computer-based science assessments*. [Paper presentation]. The 20th International Conference on Computers in Education, Singapore.
- Lee, W. Y. S., Chang, H. Y., & Wu, H.-K. (2012, July 2-7). *Relationships between representational characteristics, students' education levels, and beliefs of models*. [Paper presentation]. The International Conference on the Learning Sciences 2012, Sydney, Australia.
- Wu, H.-K., Wu, P. H., Zhang, W. X., Chang, Y. Y., Hsu, Y. S., & Hwang, F. K. (2011, September 5-9). *College and graduate students' multivariable reasoning practices in computational modeling*. [Paper presentation]. The biannual conference of the European Science Education Research Association, Lyon, France.
- Wu, P. H., Wu, H.-K., Hsu, Y. S., & Hwang, F. K. (2011, September 5-9). *Designed features and actual affordances of a computer-based modeling tool*. [Paper presentation]. The

- biannual conference of the European Science Education Research Association, Lyon, France.
- Hsu, Y. S., Wu, H.-K., Zhang, W. X., Wu, P. H., & Hwang, F. K. (2011, September 5-9). *Development of students' inquiry ability in a technology-infused learning environment*. [Paper presentation]. The biannual conference of the European Science Education Research Association, Lyon, France.
- Wu, H.-K., Hsu, Y. S., & Hwang, F. K. (2010, December 20-21). *High school students' conceptual understandings and modeling practices in a computer-based modeling environment*. [Paper presentation]. The Global Chinese Conference on Science Education 2010, Hong Kong, China.
- Wu, H.-K., & Wu, C. L. (2009, August 31-September 4). *Exploring the development of fifth graders' practical epistemologies and inquiry skills in inquiry-based learning classrooms*. [Paper presentation]. The biannual conference of the European Science Education Research Association, Istanbul, Turkey.
- Hsu, Y. S., Wu, H.-K., Hwang, F. K. & Lin, L. F., (2009, June 8-13). *Design distributed scaffolding for modeling a complex system*. [Paper presentation]. The 8th International Conference Computer Supported Collaborative Learning, Rhodes, Greece.
- Lin, L. F., Hsu, Y. S., Wu, H.-K., & Hwang, F. K. (2008, March 31-April 2). *Development of senior high school students' modeling about air quality*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, Baltimore, MD.
- Wu, H.-K., Hsu, Y. S., & Hwang, F. K. (2007, April 15-18). *Modeling a complex system: Using novex analysis for developing an effective learning module*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.
- Huang, Y.-L. & Wu, H.-K. (2007, April 15-18). *Ninth graders' conceptual understanding and cognitive engagement in teacher-centered and student-centered technology-enhanced learning environments*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.
- Hsu, Y. S., Lin, L. F., Ke, I. C., Wu, H.-K. & Hwang, F. K. (2007, April 15-18). *A comparison of experts, intermediates, novice, and naives in modeling*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.
- Hsu, Y. S., Hwang, F. K. Wu, H.-K., & Lin, L. F. (2006, August 20-25). *Analysis of experts' vs. novices' modeling*. [Paper presentation]. Modeling in Physics and Physics Education, GIREP 2006, Amsterdam, Netherlands.
- Hsu, Y. S., Ho, Y., & Wu, H.-K. (2006, June 26-30). *Examining instructional designs in technology enhanced learning environment*. [Paper presentation]. The World Conference on Educational Multimedia, Hypermedia & Telecommunications, Orlando, Florida.
- Hsin, C.-T. & Wu, H.-K. (2005, July 15-18). *Scaffolding preschoolers' scientific learning of floating and sinking*. [Paper presentation]. The Pacific Early Childhood Education Research Association Sixth Conference, Taipei, Taiwan.
- Wu, H.-K., Hsu, Y. S., & Hwang, F. K. (2005, June 27-July 2). *Teachers' adoption of technology in classrooms: Does school size matter?* [Paper presentation]. The World Conference on Educational Multimedia, Hypermedia & Telecommunications, Montreal, Canada.
- Hsu, Y. S., Wu, H.-K., & Hwang, F. K. (2005, June 27-July 2). *Do Teachers' Instructional Evolution and Teaching Seniority Affect Educational Innovation with Technology?* [Paper

- presentation]. The World Conference on Educational Multimedia, Hypermedia & Telecommunications, Montreal, Canada.
- Wu, H.-K., & Hsieh, C.-E. (2005, April 4-7). *Developing sixth graders' inquiry skills to construct scientific explanations in inquiry-based learning environments*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, Dallas, TX.
- Wu, H.-K., & Krajcik, J. S. (2004, April 1-4). *Exploring middle school students' use of inscriptions in an inquiry-based science classroom*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, Vancouver, Canada.
- Wu, H.-K., & Krajcik, J. S. (2003, March 23-26). *Inscriptional practices in inquiry-based classrooms: How do seventh graders construct and interpret data tables and graphs?* [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, Philadelphia, PA.
- Zhang, B., Wu, H.-K., Krajcik, J. S., Fretz, E. B., & Soloway, E. (2002, April 7-10). *Comparison of modeling practices between experts and novice learners using a dynamic, learner-centered modeling tool*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.
- Fretz, E., Zhang, B., Wu, H.-K., Krajcik, J.S., Soloway, E. (2002, April 1-5). *An investigation of scaffolding design and use in a dynamic modeling tool*. [Paper presentation]. In Reiser, B., Characterizing and Evaluating Software Scaffolds for Scientific Inquiry, Symposium conducted at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Wu, H.-K. (2001, March 25-28). *Connecting the microscopic view of chemistry to real life experiences*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, St. Louis, MO.
- Fretz, E. B., Wu, H.-K., Zhang, B., Krajcik, J. S., & Soloway, E. (2001, March 26-28). *An investigation of scaffolding design and use in a dynamic modeling tool*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, St. Louis, MO.
- Zhang, B., Wu, H.-K., Krajcik, J. S., Fretz, E. B., & Soloway, E. (2001, March 25-28). *Exploring middle school students' modeling process and cognitive strategies when using a computational modeling tool*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, St. Louis, MO.
- Wu, H.-K., Krajcik, J. S., & Soloway, E. (2000a, April 28-May 1). *Promoting conceptual understanding of chemical representations: students' use of a visualization tool in the classroom*. [Paper presentation]. The annual meeting of the National Association for Research in Science Teaching, New Orleans, LA.
- Wu, H.-K., Krajcik, J. S., & Soloway, E. (2000b). Using technology to support the development of conceptual understanding of chemical representations. In B. J. Fishman & S. F. O'Connor-Divelbiss (Eds.) *Proceedings of the International Conference on the Learning Sciences 2000* (pp. 121-128). Mahwah, NJ: Lawrence Erlbaum Associates.
- Wu, H.-K., Krajcik, J. S., & Soloway, E. (2000c). Students' use of a visualization tool in the classroom. In D. Fisher & J.-H. Yang (Eds.) *Proceedings of the Second International Conference on Science, Mathematics, and Technology Education* (pp. 211-221). Perth,

Australia: the National Key Centre for School Science and Mathematics, Curtin University of Technology.

Wu, H.-K., & Krajcik, J. S. (1999, October 21-23). *Explore eChem: A virtual 3D chemical experience*. [Paper presentation]. The National Science Teacher Association Area Convention, Detroit, MI.

Quintana, C., Eng, J., Carra, A., Wu, H.-K., & Soloway, E. (1999, May 19-21). *Symphony: A case study in extending learner-centered design through process space analysis*. [Paper presentation]. CHI 99: Conference on Human Factors in Computing Systems, Pittsburgh, PA.

FUNDED RESEARCH

“Teacher Noticing: Framing Science Teaching Practices in Early Science Education,” MOST 111-2410-H-003-018-MY3, National Council of Science and Technology. Principal Investigator, 8/1/2022-7/31/2024, NT\$ 4,376,000 (USD 145,800).

“The Publication of International Journal of Science and Mathematics Education,” MOST 111-2742-H-003-001-MY3, Ministry of Science and Technology. Principal Investigator, 1/1/2022-12/31/2024, NT\$ 6,122,000 (USD 218,600).

“MOST Subsidy for Recruitment of Postdoctoral Fellow: High School Teachers’ Assessment Literacy for the Curriculum of Inquiry and Practice,” MOST 110-2811-H-003-524-MY2, Ministry of Science and Technology. Principal Investigator, 8/1/2021-7/31/2023, NT\$ 1,993,000 (USD 71,180).

“High School Teachers’ Assessment Literacy for the Curriculum of Inquiry and Practice,” MOST 109-2511-H-003-015-MY3, Ministry of Science and Technology. Principal Investigator, 8/1/2020-7/31/2023, NT\$ 3,570,000 (USD 127,500).

“Early Childhood Science Education: Developing Science Curricula to Promote Young Children’s Inquiry Abilities and Improving Kindergarten Teachers’ Science Teaching Self-efficacy and Pedagogical Content Knowledge,” MOST 107-2511-H-003-012-MY3, Ministry of Science and Technology. Principal Investigator, 8/1/2018-7/31/2021, NT\$ 4,573,000 (USD 148,500).

“MOST Subsidy for Recruitment of Postdoctoral Fellow: Early Childhood Science Education: Developing Science Curricula to Promote Young Children’s Inquiry Abilities and Improving Kindergarten Teachers’ Science Teaching Self-efficacy and Pedagogical Content Knowledge,” MOST 107-2811-H-003-520, Ministry of Science and Technology. Principal Investigator, 12/1/2018-11/30/2019, NT\$ 857,100 (USD 27,800).

“Facing the Challenges of the New Curriculum Guidelines: Standard Setting and Reporting Procedures of a Computer-based Assessment of Scientific Inquiry Abilities,” MOST 106-2511-S-003-046-MY3, Ministry of Science and Technology. Principal Investigator, 8/1/2017-7/31/2020, NT\$ 3,970,000 (USD 128,900).

- “Investigating Students’ Scientific Inquiry Abilities by Using a Computer-based Assessment and Examining Science Teachers’ Needs and Practices about Computer-based Assessments,” MOST 103-2511-S-003-038-MY4, Ministry of Science and Technology. Principal Investigator, 8/1/2014-7/31/2018, NT\$ 6,439,000 (USD 214,630).
- “MOST Subsidy for Recruitment of Postdoctoral Fellow: Investigating Students’ Scientific Inquiry Abilities by Using a Computer-based Assessment and Examining Science Teachers’ Needs and Practices about Computer-based Assessments,” MOST 103-2811-S-003-010, Ministry of Science and Technology. Principal Investigator, 8/1/2014-7/31/2015, NT\$ 3,861,772 (USD 128,720).
- “Promoting the Research in the Department of Science Education,” NSC 103-2517-S-003-001, National Science Council. Principal Investigator, 1/1/2014-12/31/2014, NT\$ 1,913,000 (USD 63,700).
- “Promoting the Research in the Department of Science Education,” NSC 101-2517-S-003-005-MY2, National Science Council. Principal Investigator, 1/1/2012-12/31/2013, NT\$ 3,908,028 (USD 130,200).
- “The development of a system of simulation-based assessments to evaluate students’ inquiry skills,” NSC 100-2511-S-003-041-MY3, National Science Council. Principal Investigator, 8/1/2011-7/31/2014, NT\$ 4,118,000 (USD 136,000).
- “Multiple external representations and computer-based assessments: A study of students’ inquiry skills in simulation-based assessments,” 100-2511-S-003-042-MY3, National Science Council. Principal Investigator, 8/1/2011-7/31/2014, NT\$ 3,345,000 (USD 110,400).
- “NSC Subsidy for Recruitment of Postdoctoral Fellow: The development of a system of simulation-based assessments to evaluate students’ inquiry skills,” NSC 101-2811-S-003-005, National Science Council. Principal Investigator, 8/1/2012-7/31/2013, NT\$906,856 (USD 30,220).
- “NSC Subsidy for Recruitment of Postdoctoral Fellow: The development of a system of simulation-based assessments to evaluate students’ inquiry skills,” NSC 100-2811-S-003-009, National Science Council. Principal Investigator, 8/1/2011-7/31/2012, NT\$800,875 (USD 26,690).
- “NSC Subsidy for Recruitment of Research Scholar: Investigating Students’ Engagement and Multivariable Reasoning in Technology-Enhanced Learning Environments,” NSC 99-2811-S-003-004, National Science Council. Principal Investigator, 3/1/2010-9/30/2010, NT\$ NT\$ 737,500 (USD 24,580).
- “Investigating Students’ Engagement and Multivariable Reasoning in Technology-Enhanced Learning Environments,” NSC 97-2511-S-003 -024 -MY3, National Science Council. Principal Investigator, 8/1/2008-7/31/2011, NT\$ 4,088,000 (USD 121,000).

“Short-term Abroad Research Program: An Investigation of the Effects of Representational Scaffolds on Scientific Modeling,” NSC 97-2918-I-003-01, National Science Council. Principal Investigator, 1/23/2008-9/20/2008, NT\$ 513,000 (USD 17,100).

“An Investigation of the Effects of Representational Scaffolds on Scientific Modeling,” NSC 96-2511-S-003 -027, National Science Council. Principal Investigator, 8/1/2005-7/31/2008, NT\$ 4,225,000 (USD 140,830).

“Teacher Learning: Chemistry Teachers’ Use of Learning Technologies in Science Classrooms,” NSC 92-2511-S-003-053, National Science Council. Principal Investigator, 8/1/2003-7/31/2005 (Wu Da-Yu Memorial Award), NT\$ 1,635,100 (USD 49,550).

“Teachers-Research Collaboration Project,” Ministry of Education, Co-Principal Investigator, 08/01/2003-7/31/2006.

“Design and Implementation of Mobile Learning Technologies,” Ministry of Education, Co-Principal Investigator, 12/01/2003-11/30/2004.

INVITED ADDRESSES

International Conferences, Workshops and Presentations

Invited Speaker (online): *Science Education Research Topics and How to Find Them*, Department of Chemistry Education, Faculty of Mathematics and Natural Science, Universitas Negeri Yogyakarta, Yogyakarta, Indonesia, May 26, 2021

Invited Speaker (online): *Research on an Assessment of Inquiry Abilities*, Department of Biology Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia, November 24, 2021

Invited Speaker (online): *Science Education Research Topics and How to Find Them*, Department of Biology Education, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia, November 3, 2021

Invited Speaker (online): *Science Education Research Topics and How to Find Them*, Faculty of Science, Science Education Program, Srinakharinwirot University, Thailand, August 22, 2020

Keynote Speaker: *Developing Young Children’s Inquiry abilities: Curriculum Design and Assessment*, the International Conference on Elementary Education (ICEE), Universitas Pendidikan Indonesia (UPI), Bandung, Indonesia, November 5-7, 2019.

Keynote Speaker: *Science Inquiry and Industrial Revolution 4.0: Data Skills and Multivariable Reasoning*, the 5th International Seminar on Science Education (ISSE), Yogyakarta State University (UNY), Yogyakarta, Indonesia, October 24-26, 2019.

Invited Speaker: *From a Research Project to Publishable Studies: Experiences and Lessons Learned*, UST-NTNU Science Education Initiative 2018, University of Santo Tomas, Manila, Philippines, May 17-18, 2018.

Invited Speaker: *Inquiry-Based Learning and Learning Technology*, UST-NTNU Science Education Initiative 2018, University of Santo Tomas, Manila, Philippines, May 17-18, 2018.

Invited Speaker: *Conducting and Writing a Review Study*, Department of Science and Technology Education, Faculty of Education, University of Johannesburg, South Africa, March 23, 2018.

Keynote Speaker: *Using Dynamic Representations for Science Learning: From computer to tablet*, the 2nd International Seminar on Chemical Education (ISCE), Department of Chemistry Education, Faculty of Mathematic and Natural Sciences Islamic University of Indonesia, Yogyakarta, Indonesia, September 13, 2017.

Keynote Speaker: *From a Research Project to Publishable Studies: Experiences and Lessons Learned*, Science Education Student Research Conference (SESRC), University of Johannesburg, South Africa, August 5, 2017.

Invited Speaker: *High School Science Teachers' Conceptions of Teaching and Assessment for Inquiry: Messages from Taiwan*, Gordon Research Conference: Chemistry Education Research & Practice, Bates College, Lewiston, Maine, USA, June 20, 2017.

Keynote Speaker: *Research on a Computer-based Assessment of Inquiry Abilities*, The Fifth International Conference for Science Educators and Teachers (ISET 2017), Rajabhat Phuket University, Thailand, June 7, 2017.

Keynote Speaker: *Experiences, Reflections and Lessons Learned from Conducting Research on a Computer-based Assessment of Inquiry Abilities*, Postgraduate Research Conference, Faculty of Education, University of Hong Kong, Hong Kong, December 9, 2016.

Keynote Speaker: *Research on a Computer-based Assessment of Inquiry Abilities*, Annual International Seminar of Mathematics, Science, and Computer Science Education, Bandung, Indonesia, October 17, 2015.

Invited Speaker: *Research Approaches to Multiple Representations in Science Education*, Annual International Seminar of Mathematics, Science, and Computer Science Education, Bandung, Indonesia, October 17, 2015.

Invited Workshop Speaker: *Preservice teacher session: Are Animations Always Better than Still Images? Principles of Designing and Using Visualizations*, Faculty of Mathematics and Science Education, Indonesia University of Education, Bandung, Indonesia, October 18, 2015.

Invited Workshop Speaker: *Coaching session: Doing Science Education Research*, Faculty of Mathematics and Science Education, Indonesia University of Education, Bandung, Indonesia, October 18, 2015.

Invited Speaker: *Do Students See What We See? Students' Learning of Scientific Representations*, University of Johannesburg, University of Pretoria, University of Cape Town, South Africa, July 20-31, 2015.

Invited Speaker: *Are Animations Always Better Than Still Images? Principles of Designing and Using Visualizations for Science Teaching and Learning*, University of Johannesburg, University of Pretoria, University of Cape Town, South Africa, July 20-31, 2015.

Invited Speaker: *Research Approaches to Using Multiple Representations in Science Education*, University of Cape Town, South Africa, July 29, 2015.

Invited Workshop Speaker: *How to Design and Use Visualizations for Science Teaching and Learning*, University of Johannesburg, University of Pretoria, University of Cape Town, South Africa, July 20-31, 2015.

Keynote Speaker: *The Nature and Development of Modeling Practices: Studies on Computer-Supported Modeling*, the 30nd Annual Conference of Association of Science Education in Taiwan, December 5, 2014.

Keynote Speaker: *Research Approaches to Using Multiple Representations in Science Education*, International Science Education Conference 2014 (ISEC 2014), Singapore, November 26, 2014.

Invited Workshop Speaker: *Inquiry Learning in Technology-Enhanced Learning Environments*, International Science Education Conference 2014 (ISEC 2014), Singapore, November 25, 2014.

Plenary Lecture: *Supporting Students' Learning of Representations in Chemistry*, the 23rd IUPAC International Conference on Chemistry Education (ICCE 2014), University of Toronto and the Metro Toronto Convention Centre, Toronto, Canada, July 15, 2014.

Invited Speaker: *The nature and development of modeling practices: Studies on computer-supported modeling*, KASE International Conference Science Education Conference 2014, Daegu University, Korea, February 13, 2014.

Invited Speaker: *Modeling a Complex System: Using Novice-Expert Analysis for Developing an Effective Technology-Enhanced Learning Environment*, East-Asian Association for Science Education, EASE Summer School, July 22, 2010.

Keynote Speaker: *Inscriptions, Inquiry, Technology and Science Education*, the 25nd Annual Conference of Association of Science Education in Taiwan, December 19, 2009.

Invited Speaker: *Modeling a Complex System: Using Novice-Expert Analysis for Developing an Effective Technology-Enhanced Learning Environment*, Capital Normal University, China, June 23, 2009.

Invited Speaker: *Doing Qualitative Research with Nvivo*, Capital Normal University, China, June 24, 2009.

Invited Speaker: *Ninth Grader Student Engagement in Teacher-Centered and Student-Centered Technology-enhanced Learning Environments*, Capital Normal University, China, June 25, 2009.

Invited Speaker: *Learning Chemistry with Technology*, 2003 International Symposium on Science Education, Science Education Center, National Taiwan Normal University, November 25, 2003.

Conferences, Workshops and Presentations in Taiwan

Keynote Speaker: *Early Childhood Science Education*, International Symposia of Early Childhood STEM Education and Cognition, National Tsing-Hua University, March 25, 2018.

Invited Speaker: *Writing Research Articles: Making a Convincing Argument*, Discipline of Science Education, Department of International Cooperation and Science Education, Ministry of Science and Technology, March 25, 2016.

Invited Speaker: *Studies on a Computer-based Assessment of Inquiry Abilities*, Graduate Institute of Science Education, National Changhua University of Education, March 15, 2016.

Invited Speaker: *How to Write Research Articles*, Discipline of Mathematics Education, Department of International Cooperation and Science Education, Ministry of Science and Technology, March 20, 2015.

Invited Speaker: *Research and Design of Multiple Representations*, National Sun Yat-sen University, Institute of Education, May 2, 2014.

Invited Workshop Speaker: *Methods in Digital Learning: Video Analysis*, National Taiwan Normal University, April 11, 2014.

Invited Workshop Speaker: *Tips for Writing a Successful Grant Proposal*, National Taiwan Normal University, Office of Research and Development, November 4, 2013.

Keynote Speaker: *What is learned: Defining "Practice" in Science Education*, Taiwan CSCL & CSPL Workshop 2013, National Chengchi University, March 29, 2013.

Invited Speaker: *Planning and Implementing Research Projects*, National Taichung University of Education, Department of Science Application and Dissemination, October 24, 2012.

Invited Speaker: *Design and Implementation of Project-based Science*, Taipei First Girls High School, May 10, 2012.

Invited Speaker: *Multiple Representations and Science Learning*, National Central University, Graduate Institute of Network Learning Technology, April 12, 2012.

Keynote Speaker: *Strategies for Writing Journal Articles in Science Education*, National Sun Yat-sen University, May 28, 2011.

Invited Speaker: *Using Nvivo to Manage and Analyze Qualitative Data in Educational Research*, National Taichung University of Education, Graduate Institute of Environmental Education and Management, March 10, 2011.

Invited Speaker: *Planning and Conducting Research in Computation Modeling*, National Central University, Graduate Institute of Learning and Instruction, November 17, 2010.

Invited Speaker: *Writing for Publication in Education*, National Science Council, Department of Science Education, May 28, 2010.

Invited Speaker: *Strategies for Writing Grant Proposals*, National Science Council, Department of Science Education, May 28, 2010.

Invited Speaker: *Pursuing a PhD degree in Science Education*, National Taiwan Normal University, Graduate Institute of Environmental Education, March 22, 2010.

Invited Speaker: *Science in Cyberspace*, National Taiwan University, Center for the Advancement of Science Education, January 2, 2010.

Invited Speaker: *Strategies for Writing Journal Articles in Science Education*, National Kaohsiung Normal University, Graduate Institute of Science Education, December 24, 2009.

Invited Workshop Speaker: *Strategies and Processes of Writing for Publication*, Taipei Municipal University of Education, December 12, 2009.

Invited Speaker: *Strategies and Processes of Writing for Publication*, National Taiwan Normal University, December 3, 2009.

Keynote Speaker: *Who is Doing Research in Science Education?* The 6th Female Physicists and Chemists Joint Symposium, October 31, 2009.

Invited Workshop Speaker: *Guidelines and Examples on How to Prepare and Present an Oral Paper*, National Science Council, April 14, 2009.

Invited Speaker: *High School Students' Modeling Practices*, National Sun Yat-sen University, Institute of Education, April 8, 2009.

Invited Speaker: *Strategies for Writing Grant Proposals*, National Taiwan Normal University, Office of Research and Development, September 25, 2008.

Invited Workshop Speaker: *Qualitative Research Methods in Science Education*, National Research Council, November 10, 2007.

Invited Speaker: *Inscriptional Practices and Science Learning*, National Hualien University of Education, September 27, 2006.

Invited Speaker: *Inscriptional Practices and Science Learning*, National Taipei University of Education, Department of Science Education, June 5, 2006.

Invited Speaker: *Visual-Spatial Thinking in Chemistry Learning*, National Kaohsiung Normal University, October 6, 2005.

Invited Speaker: *Integrating Learning Technologies into Chemistry Teaching*, National Taipei Teachers College, March 30, 2005.

Invited Speaker: *Learning Technologies and Chemistry Learning: From Atoms to Real World*, Professional Development Workshop for Junior High School Science Teachers, Ming-De Junior High School, Keelung City, November 25, 2004.

Invited Speaker: *Software Scaffolds in a Modeling Tool*, Graduate School of Science Education, Taipei Municipal Teachers College, May 4, 2004.

Invited Speaker: *Multimedia and Chemistry Learning*, Professional Development Workshop for High School Chemistry Teachers, Science Education Center, National Taiwan Normal University, April 15, 2004.

Invited Speaker: *Exploring Visuospatial Thinking in Chemistry Learning*, The Annual Meeting of Chemical Society located in Taipei, Chung Yuan Christian University, November 29, 2003.

Invited Speaker: *An Investigation of Software Scaffolds Supporting Modeling Practices*, Department of Earth Science, National Taiwan Normal University, October 30, 2003.

Invited Speaker: *Learning Technologies and Chemistry Education*, Graduate Institute of Science Education, National Changhua University of Education, September, 2003.

Invited Speaker: *Learning Technologies in Chemistry Education*, Department of Chemistry, National Taiwan Normal University, April 21, 2003.

SERVICE ACTIVITIES

Editorial Positions

2022-present: Editor-in-Chief, *International Journal of Science and Mathematics Education*

2020-2025: Associate Editor, *Journal of Research in Science Teaching*

2017-2021: Senior Editor, *International Journal of Science and Mathematics Education*

2014-2017: Associate Editor, *International Journal of Science and Mathematics Education*

2016-2020: Editorial Board Member, *American Educational Research Journal*

2006-2022: Editorial Board Member, *Science Education*

2005-present: Consulting Editor (Research Section), *Educational Technology Research and Development*

2015-present: Editorial Advisory Board Member, *Learning: Research and Practice*

2012-2015: Editorial Board Member, *Journal of Research in Science Teaching*

2009-2014: Associate Editor, *Journal of Research in Education Science*

2012-2013: Editorial Board Member, *International Journal of Science and Mathematics Education*

2003-2006: International Contributing Editor, *Science Education*

Manuscript Reviewer

African Journal of Research in Mathematics, Science and Technology Education; American Educational Research Journal; Chemistry Education Research and Practice; Computers & Education; Educational Assessment; Educational Technology Research and Development; Educational Technology & Society; European Journal of Psychology of Education; Innovations in Education and Teaching International; Interactive Learning Environments; International Journal of Environmental and Science Education; International Journal of Science and Mathematics Education; International Journal of Science Education; Journal of Applied Psychology; Journal of the Learning Sciences; Journal of Research in Science Teaching; Journal of Science Education and Technology; Research and Practice in Technology Enhanced Learning; Review of Educational Research; Science Education; Turkish Online Journal of Educational Technology.

Conference Paper Reviewer

American Education Research Association (AERA), ASETA Annual International Conference, European Science Education Research Association (ESERA), International Conference on Chemical Education (ICCE), International Conference on Computers in Education (ICCE), International Conference of East-Asian Science Education (EASE), International Conference on the Learning Sciences (ICLS), National Association for Research in Science Teaching (NARST), International conference on Science, Mathematics and Technology Education (SMTE), Mobile and Ubiquitous Technologies Enhanced Learning Conference, International History, Philosophy and Science Teaching Asian Regional Conference (IHPST).

Conference and Organization Service

2020-2023: Early Career Award Committee Member and Co-chair, National Association for Research in Science Teaching (NARST)

2018: Evaluation Committee Member, Outstanding Paper Award of 2018 International Conference of East-Asian Association for Science Education

2016-2017: Program Committee Member, Track 8: Technology-Enhanced Science, Technology, Engineering and Math Education in the 16th and 17th IEEE International Conference on Advanced Learning Technologies (ICALT).

2016-2017: Program Committee Member, Track 8: Technology-Enhanced Science, Technology, Engineering and Math Education in the 16th and 17th IEEE International Conference on Advanced Learning Technologies (ICALT).

- 2015-2018: Member of the Ad Hoc Website Provider Committee, National Association for Research in Science Teaching (NARST)
- 2015-2018: Award Committee Member (Outstanding Dissertation Award), National Association for Research in Science Teaching (NARST)
- 2015: Program Committee Member, The 23rd International Conference on Computers in Education (ICCE 2015), Hangzhou, China.
- 2015: Program Committee Member, Track 11: Technology-Enhanced Learning of Thinking Skills (TELoTS) in the 15th IEEE International Conference on Advanced Learning Technologies (ICALT2015).
- 2015: Track Program Committee Member, Track 11. Technology-Enhanced Learning of Thinking Skills (TELoTS) in the 15th IEEE International Conference on Advanced Learning Technologies (ICALT2015).
- 2014: Program Committee Member, The 22nd International Conference on Computers in Education (ICCE 2014), Nara, Japan.
- 2013: Program Committee Member, Global Chinese Conference on Computers in Education (GCCCE 2014), East China Normal University, China.
- 2013: Program Committee Member, The 21st International Conference on Computers in Education (ICCE 2013), Singapore.
- 2012: Discussant, The 20th International Conference on Computers in Education (ICCE 2012) (November 26-30), "Workshop 8: Computer-supported Visualization, Modeling, and Simulation for Learning," Organizers: Silvia Wen-Yu Lee and Hsin-Yi Chang.
- 2012: Advisory Committee Member, Asia Pacific Society of Computers in Education.
- 2012: International Organizing Committee Member, International Conference on Science Education 2012.
- 2011: Discussant, Computer Supported Collaborative Learning conference (CSCL) 2011 (July 4-8), "Collaboration as Scaffolding: Learning Together with Dynamic, Interactive Scientific Visualizations and Computer Models," Chair: Marcia Linn, Organizers/editors: Ji Shen, Hsin-Yi Chang.
- 2010: Senior Program Committee Member, the 21st International Conference on Chemical Education (ICCE), Taipei, Taiwan.
- 2009: Conference Advisory Committee, International Conference of East-Asian Science Education (EASE), Taipei, Taiwan.
- 2009: The International Scientific Committee Member, European Science Education Research Association 2009 Conference (ESERA)
- 2008-2011: Committee Member, Association of Science Education in Taiwan.
- 2008-2011: Award Committee Member (Early Career Award), the annual meeting of National Association for Research in Science Teaching (NARST)

- 2008: Program Committee Member, The Third Mobile and Ubiquitous Technologies Enhanced Learning Conference
- 2008: Senior Program Committee Member, Session Chair, the 16th International Conference on Computers in Education (ICCE), Taipei, Taiwan.
- 2007-2009: Strand Coordinator (Strand 12: Educational Technology), the annual meeting of National Association for Research in Science Teaching (NARST)
- 2007: Advisory Committee and Session Chair, Second NICE Symposium, Network for Inter-Asian Chemistry Educators, Taipei, Taiwan.
- 2003, 2006: Conference Coordinator, The Annual Conference of Science Education in Taiwan.
- 2005: Doctoral Consortium Panelist, Computer Supported Collaborative Learning conference (CSCL) 2005.

Other Service to the Field

- 2023: University of Rwanda, College of Education, External Reviewer
- 2017-2023: Research Grants Council (RGC) of Hong Kong, External Reviewer of Grant Proposals and Reports
- 2016, 2017, 2022: Reviewer of Grant Proposals, Israel Science Foundation (ISF)
- 2021: University of KwaZulu-Natal, School of Education, External Reviewer
- 2014-2020: National Institute of Education, Singapore, External Reviewer of Grant Proposals and Reports
- 2018: Nanyang Technological University of Singapore, National Institute of Education, External Reviewer
- 2017: University of Queensland, School of Chemistry & Molecular Biosciences, International examiner of MPhil thesis
- 2014-2020: External Reviewer of Grant Proposals and Reports, National Institute of Education, Singapore
- 2016-2017: University of Johannesburg, South Africa, External Assessor of PhD Research Project
- 2016-2017: Reviewer of Grant Proposals, Israel Science Foundation (ISF)
- 2016: The Education University of Hong Kong, Graduate School, External Examiner of PhD Thesis
- 2015-2016: Researcher Performance Reviewer (Peer-Review), National Research Foundation (NRF) of South Africa
- 2015-2017: Review Committee Member of the Medical Education Discipline, Department of International Cooperation and Science Education, Ministry of Science and Technology, Taiwan

- 2013-2016: External Reviewer of Faculty Evaluation, Department of Higher Education, Ministry of Education, Taiwan
- 2012-2014: Convener of the Science Education Discipline, Department of International Cooperation and Science Education, Ministry of Science and Technology, Taiwan
- 2014: External Reviewer of Faculty Evaluation, College of Science, National Changhua University of Education, Taiwan
- 2014: External Reviewer of Grant Proposals, Research Grants Council (RGC) of Hong Kong
- 2013: External Reviewer of Faculty Evaluation, College of Electrical Engineering & Computer Science, National Central University, Taiwan
- 2013: External Reviewer, School of Education and Human Development, University of Miami, USA
- 2012: External Reviewer, College of Education, University of Georgia, USA
- 2011: Member of Distinguished Professors Committee, College of Science, National Changhua University of Education, Taiwan
- 2010: External Reviewer of Faculty Evaluation, College of Humanity and Social Science, National Chiao Tung University, Taiwan
- 2008-2011: Award Committee Member (Early Career Award), National Association for Research in Science Teaching (NARST)
- 2006: Member of Master Program Application Committee, Institute of Education, National Chiao Tung University, Taiwan
- 2005-2015: Reviewer of the Science Education Discipline, Department of International Cooperation and Science Education, Ministry of Science and Technology, Taiwan

TEACHING

Courses

- SEC0001 Colloquium
- SEC0038 Qualitative Research
- SEC0050 Methods in Research on Learning Technologies
- SEC0051 Introduction to Learning Technologies in Science Education
- SEC0052 Social Constructivism and Science Education
- SEC0053 Theory and Research in Learning Technologies
- SEC0054 Development and Design of Technology-Based Learning Environments
- SED0033 Special Topics in Science Education: Academic Writing

SED0075 Special Topics in Research on Science Education

SED0092 Seminar on Digital Learning

SEM0018 Independent Study

SEM0019 Seminar: Research Issues in Science Education

STD0003 Trends and Issues in STEM Education

00UE031 Educational Technology (Teacher Education Program)

In-service Teacher Master Program: Learning Technologies and Science Education

International Student Supervision

Euis Nursaadah (November 2017- January 2018), Doctoral student, Science Education, Universitas Pendidikan Indonesia (UPI), Bandung, Indonesia

Rif'at Shafwatul Anam, (November 2017- January 2018), Doctoral student, Science Education, Universitas Pendidikan Indonesia (UPI), Bandung, Indonesia

Courtney Stanford (June-August 2015), PhD student, Department of Chemistry, University of Iowa, USA

Former Graduate Advisees

Chou-En Hsieh, M.S., 2004, Developing the Skills Sixth Graders Need for Constructing Scientific Explanations in Inquiry-based Learning Environments.

Ya-Lin Huang, M.S., 2005, Ninth Grade Student Engagement in Different Technology-Enhanced Learning Environments.

Bing-Hui Jian, M.S., 2005, Integrating Information Technology into Teaching: A Survey Study of Science Teachers in Taipei City's Junior High Schools.

Chai-Lien Wu, M.S., 2006, Exploring the Development of Fifth-Grade Students' Explanation Skills and Their Scientific Epistemologies in Inquiry-Based Activities.

Sung-Pei Chien, M.S., 2007, Exploring High School Pre-service Teachers' Identity Development and Participation in a Community of Practice: From a Situated Cognition Perspective.

Chi-Yin Yang, M.S., 2007, Investigating the Effects of Virtual and Hands-on Experiments on Eighth Graders' Conceptual Understanding about Image Formation by Lenses

Tsai-Liang Liao, M.S., 2007, The Effects of Applying the 4MAT System to the Photosynthesis Unit in a Junior High School.

Shin-Wen Wang, M.S., 2008, Investigating the Effects of Computer Simulations on Seventh Graders' Conceptual Understanding about Genetics.

- Yu-Hsiang Hsu, M.S., 2008, An Investigation of Interactions among School Culture, School Size, and Teachers' Integration of Technology at Junior High Schools in Taipei City.
- Chin-Feng Chien, M.S., 2008, Exploring the Impacts of Written Scaffolds on Seventh Graders' Scientific Explanation Skills.
- Pai-Hsing Wu, M.S., 2008, Aboriginal Students' Learning in a Design-based Science Classroom: An Investigation of Their Ethnic Identity, Attitudes toward Science, Process Skills, and Conceptual Understandings.
- Benji Lu, M.S., 2010, An Investigation of Students' Modeling Practices by Using a Scaffolded Technology-Based Modeling Tool.
- Hsin-Mei Wang, M.S., 2011, The Analysis of Sequence, Continuity and Articulation in Grade 1-9 Mathematics Textbooks: The Case of Statistics and Probability.
- Yu-Fen Lin, M.S., 2011, Effects of Representation Sequences and Spatial Ability on Students' Scientific Understandings about the Mechanism of Breathing.
- Hui-Jen Huang, M.S., 2012, The Effects of Double Scaffolding on Problem Solving with Multiple Representations in a Dynamic Geometry Environment - Linear Equations with Two Variables.
- Xue-Fang Weng, M.S., 2013, Using Science News to Develop Ninth Grade Students' Explaining Practices.
- June-Yi Wang, M.S., 2014, The influence of visual-motor integration and spatial ability on mechanics concept learning of tenth grade student with different technology usage.
- Yi-Fan Sun, M.S., 2014, A junior high school science teacher's instruction to students with learning disabilities.
- Yu-Lu Su, M.S., 2015, Investigating the relationships between instructional modules, graphing skills, and conceptual understandings: Eighth graders' learning about density.
- Yi-Chung Su, M.S., 2016, Senior high school students' problem solving approaches when solving problems at different levels and with different representations
- Pai-Hsing Wu, Ph.D., 2018, Structural models of the influence on secondary school students' inquiry abilities: investigating the relationships among the learning experiences, inquiry-related curiosity, engagement, and inquiry abilities of students
- Sung-Pei Chien, Ph.D., 2019, Three studies of the relationships among science teachers' beliefs about, practice on and their students' performances on a technology-based assessment
- Chia-Yin Lin, M.S., 2019, The impact of different ways to use visualization on high school students' learning in electrochemistry

Wan-Chi Hsu, M.S., 2020, Research of kindergarten children's development of scientific inquiry abilities during a science inquiry module

Ching Sui Hung, Ph.D., 2022, A series of studies on assessment literacy and the teaching conceptions about the curriculum "Inquiry and Practice" of high school science teachers

Wen-Ting Chen, M.S., 2023, Exploring elementary teachers' noticing to science teaching and learning

Doctoral Dissertation Committees

Pei-Lan Chen, completed, July 2007, National Chung Cheng University

Chih-Kang Chang, completed, July 2009, National Taiwan Normal University

En-Jay Lin, completed, July 2011, University of Taipei

Wen-Long Wu, completed, July 2012, National Taiwan Normal University

Li-Fen Lin, completed, July 2012, National Taiwan Normal University

Hsiu-Mei Chang, completed, July 2014, National Central University

Ngai Ying Ching, August 2016, Education University of Hong Kong

Lydia Mavuru, August 2016, University of Johannesburg

Tian Luo, 2020, Education University of Hong Kong

Song Xue, 2022, University of Dundee