

Lin Xiang, Ph.D.

Curriculum Vitae: August 2018

Assistant Professor
Department of STEM Education
College of Education
University of Kentucky
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I. EDUCATION

Ph.D. Science Education, University of California, Davis, 2011

Emphasis Area: Technology-supported science education, Biology Education, Model-based teaching and learning

Dissertation Title: *A Collective Case Study of Secondary Students' Model-Based Inquiry on Natural Selection through Programming in an Agent-Based Modeling Environment*

M.A. Education, University of California, Davis, 2005

B.S. Biology, Nanjing University, Nanjing, China, 1997

II. PROFESSIONAL EXPERIENCE IN EDUCATION RESEARCH

Assistant Professor, 2018-present

University of Kentucky, Department of STEM Education

Assistant Professor, 2016-2018

Weber State University, Center for Science and Math Education (CSME), Department of Zoology,

Program Evaluator, 2016-present

University of Kentucky, College of Medicine

NIH-funded project: *Undergraduate Research Experience in Environmental Health Sciences (SUREES) Program*

Co-researcher/Program evaluator, 2016-present

Weber State University, Center for Science and Mathematics Education

USHE project: *Improve the odds: Increasing the Number of High School Math Teachers Qualified to Teach Concurrent Enrollment Quantitative Literacy Classes*

Internal Program Evaluator, 2014-2016

University of Kentucky, Department of Biology

HHMI program: *Student Retention and Success in STEM through collaborative and multi-layered STEM Cats Freshmen*

Project Investigator, 2013 – 2015

University of Kentucky, Department of Biology
Education Research Project: *Metacognitive Instruction in Postsecondary Biology*

Project Investigator, 2012 – 2015

University of Kentucky, Department of Biology
Education Research Project: *Inquiry Instruction in Postsecondary Biology*

Co-researcher/Program evaluator, 2013- 2016

University of Kentucky, Department of STEM Education
NSF-REU Program: *Supporting Undergraduate Research Fellows in Timely STEM Education Research via the University of Kentucky's STEM Education Research Laboratory*

Co-researcher/Program evaluator, 2012

University of Kentucky, Department of Biology
NSF-REU Program: *Suburban Ecology and Invasive Species*

Consultant and data analyst, 2012

University of California, Davis,
School of Education
NSF-funded Project: *Innovations in Science Instruction through Modeling (ISIM)*

Lesson study facilitator, 2009 – 2010

University of California, Davis,
School of Education
NSF-funded Project: *Innovations in Science Instruction through Modeling (ISIM)*

Research assistant, 2006 – 2011

University of California, Davis,
School of Education
NSF-funded research project: *Inquiry into Practice (IIP)*

III. TEACHING EXPERIENCE

Assistant Professor, 2018-present

University of Kentucky, Department of STEM Education
Course: Teaching Science in the Elementary School

Assistant Professor, 2016-2018

Weber State University, Department of Zoology

- Secondary Science Teaching Methods
- Foundation of Science Education
- Life Science Principles for Education Major
- Utah Elementary STEM Endorsement Professional Development Series
- Principles of Zoology laboratory

- Diversity of Animals laboratory

Instructor and Senior Academic coordinator, 2012-2016

University of Kentucky, Department of Biology

Courses: BIO 155 Introductory Biology Laboratory, BIO 303 Introduction to Evolution

- Coordinate introductory biology laboratory and evolution recitations required for biology majors
- Teach introductory biology laboratory
- Identify, develop, and implement active learning biology introductory lab exercises
- Develop and implement computer-based recitation lessons
- Plan and implement graduate student assistant teaching orientations
- Supervise teaching assistants and oversee their professional development
- Taught the recitation of Introduction to Evolution

National Academies Education Fellow in the Life Science, 2013-2014

Co-instructor, 2008

University of California, Davis,

School of Education

Summer Institute of *Innovations in Science Instruction through Modeling (ISIM)*

Teaching topics:

- Students' learning capacities related to model-based reasoning
- Relationship between model-based reasoning and how people learn
- Assessing students' model-based reasoning

Co-instructor, 2008

Science in the River City (SIRC)—Sacramento Area Professional development workshop for science teachers

Teaching topic: Using computer simulations to understand genetics

Teaching Assistant, 2007

University of California, Davis,

School of Education,

Courses: EDU 110 Educational Psychology; Multicultural Classroom

Biology Teacher, 1997-2002

Shanghai Jin Cai High School, Shanghai, China

- Taught high school biology courses
- Coordinated high school biology laboratory
- Designed and implemented computer-enhanced biology lessons
- Supervised student-centered biological science inquiry projects

IV. PUBLICATIONS AND PRESENTATIONS

Journal articles

Xiang, L. & Mitchell, A. (in press). Investigating Bark Beetle Outbreaks in Forest Ecosystems Using Computer Models. *Science Scope*.

Rodrigo-Peiris, T., **Xiang, L.**, and Cassone, V.M. (in press). A low-intensity, hybrid design between a 'traditional' and a 'course-based' research experience yields positive outcomes for science undergraduate freshmen and shows potential for large-scale application. *CBE--Life Sciences Education*.

Swanson, H.I., Sarge, O.P., Rodrigo-Peiris, T., **Xiang, L.** and Cassone, V.M. (2016). Development of a Course-based Undergraduate Research Experience to Introduce Drug-Receptor Concepts. *Journal of Medical Education and Curricular Development*. V3, 57-66.

Franklin, B., **Xiang, L.**, Collett, J, Rhoads, M., & Osborn, J. (2015). Open problem-based instruction impacts understanding of physiological concepts differently in undergraduate students. *Adv Physiol Educ*. V 39(4), 327-334.

Xiang, L., & Passmore, C. (2015). A Framework for Model-Based Inquiry Through Agent-Based Programming. *Journal of Science Education and Technology*. V24 (2), 311-329.

Xiang, L., & Passmore, C. (2010). The Use of Agent-based Programmable Modeling Tool in 8th Grade Students' Model-Based Inquiry. *The Journal of the Research Center for Educational Technology*, V6 (2), 130-147.

Manuscripts in preparation

Xiang, L. (in Preparation.) Biology Undergraduates' View about Nature of Science and Authentic Scientific Inquiry. *Journal of College Science Teaching*

Xiang, L. (in Preparation.) Exploring the Use of Agent-based Modeling Tools in introductory biology laboratory to promote undergraduates' learning. *Journal of College Science Teaching*.

Invited talks

Xiang, L. (2015, April). Continuous improvement of teaching using classroom assessment and introduction to conducting education research. STEM Teaching Enhancement Workshop and Forum. University of Kentucky, Lexington, KY.

Paper/Project presentation sessions

Sinapuelas, M., Korb, M., DiStefano, R., Ross, D., Vaughn, M., Horvath, L., **Xiang, L.** & Lardy, C. (2018). Identifying phenomenon for NGSS: Using preservice teacher data to inform instruction in science methods courses. Presented at the American Educational Research Association Annual Conference, New York City. April 2018.

Xiang, L. & Mitchell, A. (2018). Big Pumpkins: Using Computer Models to Investigate Inheritance and Variation in the Garden. Presented at the National Science Teachers Association Conference, Atlanta, GA. March 2018.

Mitchell, A. & **Xiang, L.** (2018). Investigating Bark Beetle Outbreaks in Forest Ecosystems Using Computer Models. Presented at the National Science Teachers Association Conference, Atlanta, GA. March 2018.

Xiang, L. (2017). Biology Undergraduates' Perceptions of Nature of Science and Scientific Inquiry. Presented at the Association for Science Teacher Education (ASTE) International Conference, Des Moines, IA. 2017.

Xiang, L., Bouwma-Gearhart, J. & Osborn, J. (2013). Effects of Problem-based Learning on Biology Students' Conceptual Understandings about Animal Physiology and Student Perceptions. Presented at the National Association for Research in Science Teaching Annual Conference, Rio Grande, Puerto Rico. April 2013.

Xiang, L., & Passmore, C. (2011). "I just Want to Make It Work": Examining Students' Programming Actions Impeding Productive Model-based Inquiry. Presented at the National Association for Research in Science Teaching Annual Conference, Orlando, FL, April 2011.

Xiang, L., & Passmore, C. (2010). Programming a Simulation to Support 8th Grade Students' Model-based Learning about Natural Selection. Presented at the National Association for Research in Science Teaching Annual Conference, Philadelphia, PA, March 2010.

Xiang, L., Hvidsten, C., Dowd, P., Beauchamp, A., & Passmore, C. (2010). Teachers' perceptions of the barriers to classroom implementation of model-based reasoning. Presented at the Association for Science Teacher Education Annual conference, Sacramento, CA, January 2010.

Posters

Swanson, H. I. & **Xiang, L.** (2018). Initial Assessment of a Summer Undergraduate Research Program. Society of Toxicology 57th Annual Meeting, San Antonio, TX, March, 2018.

Passmore, C., **Xiang, L.,** Hedman, R., & Hvidsten, C. (2009). The affordances of placing model-based inquiry at the center of professional development. American Educational Research Association Annual Conference, San Diego, CA, April 2009.

Passmore, C., Hvidsten, C., & **Xiang, L.** (2009). The Visionary and the Naysayer: Understanding the Dual Views Held by Teachers in the Midst of Enacting Model-based Inquiry. American Educational Research Association Annual Conference, San Diego, CA, April 2009.

Symposium

Exploring Pathways for Science Teacher Transformation: Evidence for the role of Context, Community, and Identity. Presider: Richmond, G.; Discussants: Passmore, C., UC Davis, Roth, K., LessonLab Research Institute; Manokore, V., Michigan State University; Birmingham, D., Michigan State University; **Xiang, L.,** UC Davis, Hvidsten, C., UC Davis, Hedman, R., UC Davis. National Association for Research in Science Teaching Annual Conference, Garden Grove, CA, April 2009.

V. CURRICULUM DEVELOPMENT

In-service Teacher Professional Development

- Established website to provide three-dimensional science lessons (<http://3Dsciencelessons.com>) 2017-present.
- Developed PD training sessions for Utah Elementary STEM Endorsement Professional Development Series, Weber State University, Utah, 2017-present.

Postsecondary level

- Developed NGSS-aligned introductory life science course for education major at Weber State University, Utah, 2018.
- Developed NGSS-aligned secondary science teaching methods course at Weber State University, Utah, 2017.
- Developed laboratory material, including lab manual, course website and YouTube tutorial, to teach Principles I lab course at Weber State University, Utah, 2016.
- Developed laboratory material, including lab manual, course website and YouTube tutorial, to teach phylogeny reconstruction in BIO 155 course at the University of Kentucky, Kentucky, 2014.
- Developed and implemented hands-on activities for students in BIO 155 at the University of Kentucky to understand scientific inquiry and nature of science, Kentucky, 2013.
- Developed and implemented hands-on activities for students in BIO 155 at the University of Kentucky to demonstrate Central Dogma via model-based reasoning, Kentucky, 2013.
- Designed agent-based modeling computer module for students in BIO 155 at the University of Kentucky to explore the underlying mechanisms and processes of speciation, Kentucky, 2013.
- Integrated concept mapping activities into Bio 155 at the University of Kentucky for students to visual and organize biological concepts, Kentucky, 2013.
- Designed agent-based modeling computer module for students in BIO 155 and BIO 303 at the University of Kentucky to explore interplay between sex attractiveness and predation, Kentucky, 2012.
- Designed agent-based modeling computer module for students in BIO 155 at the University of Kentucky to explore allopatric speciation, Kentucky, 2010.

K-12 level

- Collaborated with science teacher in Shadow Valley Elementary School and New Bridge Elementary School in Ogden, Utah, to develop computer-enhanced modeling unit for elementary and middle students to explore bark beetle epidemic in North America, 2016.
 - Developed the computer model and the class modeling activities
 - Conducted teaching demonstrate in New Bridge Elementary School
 - Collected learning outcome data from students in both schools
- Designed multimedia virtual lab for high school students to explore photosynthesis, Shanghai, China, 2000.
- Designed multimedia simulation for high school students to learn mitosis and Meiosis, Shanghai, China, 1999.

- Designed multimedia class module “*How do Plant Roots Absorb Water*” for high school students to understand osmosis, Shanghai, China, 1999.
- Designed multimedia class module for high school students to learn about DNA structure, Shanghai, China, 1998.

VI. FELLOWSHIPS, HONORS AND AWARDS

Block Grant fellowship, 2004 – 2009
University of California, Davis, School of Education,

Honored as Young Teacher for excellent work, 1998 – 2000
Pudong New District Shanghai Education Committee, Shanghai, China,

Excellence Teaching Awards, 1998
Pudong New District Shanghai Education Committee, Shanghai, China,

VII. PROFESSIONAL AFFILIATIONS

National Science Teacher Association (NSTA)
American Educational Research Association (AERA)
National Association for Research in Science Teaching (NARST)
Association for Science Teacher Education (ASTE)