Abraham (Abe) S. Lo, Ph.D.

PROFESSIONAL SUMMARY

Lo is a Senior Science Educator at BSCS Science Learning with over two decades of experience as a researcher, professional learning designer, instructional materials developer, university instructor, and teacher leader. He specializes in designing research-based interventions and professional learning models that foster equitable and meaningful science learning opportunities for all students.

EDUCATION

Northwestern University, School of Education and Social Policy Evanston, IL, USA
Ph.D., Learning Sciences 2010-2017

- **Dissertation:** *Epistemic aims, considerations, and agency: Lenses for helping teachers analyze and support students' meaningful engagement in scientific practices*
- **Honors:** AERA Minority Dissertation Fellowship in Education Research; Institute of Education Sciences Pre-Doctoral Interdisciplinary Research Training Fellowship; University Fellowship

University of Pennsylvania, Graduate School of Education Philadelphia, PA, USA
Master of Science in Education, Secondary Education 2002-2003

- **Master's Thesis**: *Creating a Meaningful Learning Environment by Incorporating Students' Sociocultural Capital*
- **Honors**: Dean's Urban Teacher Education Scholar; David B. Brownlee Fellow for School of Arts & Sciences Advising

University of Pennsylvania, College of Arts and Sciences Philadelphia, PA, USA
Bachelor of Arts in Biology, cum laude 1998-2002

PROFESSIONAL APPOINTMENTS

BSCS Science Learning Colorado Springs, CO, USA

- *Senior Science Educator* 2024-Present
- *Science Educator* 2018-2024

Hamline University, College of Liberal Arts Saint Paul, MN, USA

- *Graduate Adjunct Faculty* 2025-Present

University of California Museum of Paleontology Berkeley, CA, USA

- *Museum Associate* 2019-Present

San Francisco Unified School District San Francisco, CA, USA

- *Middle School Content Specialist and Instructional Coach* 2017-2018

University of California, Davis, School of Education Davis, CA, USA

- *Postdoctoral Scholar* 2015-2016

Northwestern University, School of Education and Social Policy Evanston, IL, USA

- *Instructor, NU-TEACH: Alternative Certification Program* 2011-2013
- *Graduate Research and Teaching Assistant* 2011-2015

Wycombe High School High Wycombe, Buckinghamshire, UK

- *Teacher of Science and Sixth Form Tutor* 2008-2010

Wissahickon High School Ambler, PA, USA

- *Teacher, Biology and Physical Science* 2004-2008

Franklin Towne Charter High School Philadelphia, PA, USA

- *Teacher, Biology and Physics* 2003-2004

FUNDED RESEARCH & DEVELOPMENT PROJECTS

BSCS Science Learning

Colorado Springs, CO, USA

***Developing Teacher Leaders' Capacity to Promote 5D Teaching and Learning in Secondary Science Classrooms (Co-PI**, NSF DUE 2343911, $2,992,228)* 2024-Present

- Support 18 secondary science teacher leaders from Saint Paul Public Schools in adopting classroom practices that engage their students' interests and science-linked identities. Leaders will use what they learn to support teachers within the district and the state of Minnesota.
- Design and teach graduate-level Ed.S. courses: *GED 8498-1: Special Topics: Meaningful Instruction and Assessment* (Summer 2025); GED 8022-1: *Action Research* (Fall 2025), *GED 8210-1: Investigating Contemporary and Critical Issues in Education* (Spring 2026)
- Oversee and manage project professional learning and research activities in partnership with the University of Minnesota, Hamline University, and Saint Paul Public Schools

***Engaging Science Learning with OpenSciEd (Co-PI**, US Department of Education, S411C230181, $3,999,759)* 2024-Present

- Co-lead the design of the customized professional learning program to support 8th grade teachers in implementing customized OpenSciEd scope and sequence aligned with Louisiana science standards. This program included 4-day summer institutes and the facilitation of professional learning communities.
- Develop Southern University faculty's capacity to facilitate OpenSciEd professional learning.

***Preparing Teachers to Design Tasks to Support, Engage, and Assess Science Learning in Rural Schools (Co-PI**, NSF DRL 2010086, $2,979,000)* 2020-2025

- Led the design of 5D Assessment professional learning approach and tools to support science teachers in adopting NRC *Framework*-aligned assessment practices that engage their students' interests and identities as knowers, doers, and users of science.
- Co-led the quantitative and qualitative analyses demonstrating statistically significant impact of professional learning course on rural science teachers' assessment practices. Evidence of impact can be found on project website, 5Dassessment.org.
- Oversaw and managed all aspects of the project research and design work at BSCS Science Learning and our partners at the University of Colorado Boulder.

***Communities Supporting Teacher Learning: Using Videocase Analysis of Teaching and Learning to Support Undergraduate Preservice Secondary Science Teachers (Co-PI**, NSF DUE 1725389, $3,035,805)* 2018-2024

- Co-designed the professional learning program to support university science faculty, university education faculty, and cooperating teachers in using the STeLLA conceptual framework (bscs.org/STeLLA) to enhance the effectiveness and coherence of their undergraduate preservice science teacher (PST) preparation programs.
- Oversaw research efforts to understand 1) the successes and challenges involved in engaging in cross-stakeholder collaborations and 2) how the university team members' work led to changes in PSTs' classroom practices and their students' science learning. Key findings can be found at bscs.org/STeLLACO2.

***Supporting Students' Meaningful Use of the Crosscutting Concepts (PI**, Carnegie Foundation & Digital Promise, $9,000)* 2022-2023

- Developed professional learning workshop to help secondary science teachers support their students' meaningful use of the 3Ds while using the OpenSciEd instructional materials.

***Building Capacity to Analyze and Adapt Tasks Focused on 3-Dimensional Learning** (Key Personnel, NSF DRL 1748757, $299,837)* 2018-2020

- Conducted early-stage research to understand: (1) how we can prepare teachers to support three-dimensional (3D) science learning and (2) how teachers assess 3D science learning of diverse students
- Co-designed rubric to analyze teacher-designed assessments and understand the impact of professional learning teachers' assessment practices

University of California, Davis, School of Education Davis, CA, USA

Modeling Scientific Practice in High School Biology: A Next Generation Instructional Resource 2015-2016

(Postdoctoral Scholar, NSF DRL 1348990, $1,963,466)

- Investigated teachers' enactment of a year-long model-based high school biology program

Northwestern University, School of Education and Social Policy Evanston, IL, USA

Supporting Scientific Practices in Elementary and Middle School Classrooms 2011-2015

(Key Personnel, NSF DRL 1020316, $3,495,230)

- Co-developed framework and professional learning program to support students' meaningful engagement in scientific practices
- Coordinated data collection at five research sites and supervised undergraduate research assistants

Clark University Worcester, MA, USA

Next Generation Science Exemplar System for Professional Development (NGSX) 2013-2014

(Key Personnel, NSF DRL 1251611, $217,159)

- Supported the design of a web-based professional development system to support classroom use of modeling and argumentation
- Analyzed pre- and post-intervention surveys to ascertain changes in teachers' understanding of scientific practices and the effectiveness of the NGSX platform

PEER-REVIEWED RESEARCH PRODUCTS

Publications

Lo, A. S., Herrmann Abell, C. F., Penuel, W. R., Allen, A.-R., Cherbow, K., Gardner, A., Glidewell, L., Jacobs, J. K., & O'Connor, K. (In revision). Developing Teachers' Pedagogical Design Capacity for Assessment: Results of an Experimental Study of an Online Course for Rural Science Educators.

Glidewell, L., Jacobs, J. K., Allen, A.-R., Penuel, W. R., & **Lo, A. S.** (2025). A Comparative Case Analysis of Rural Science Teachers' Experiences with Professional Learning. *The Rural Educator*, 46(3), 43–59. https://doi.org/10.55533/2643-9662.1529

Penuel, W. R., O'Connor, K., Allen, A.-R., Jacobs, J. K., & **Lo, A. S.** (2025). Examining Science Teachers' Conceptions of Student Interest as a Consideration in Designing Assessments. *Journal of Science Teacher Education*, 36(5), 643–663. https://doi.org/10.1080/1046560X.2024.2435747

Lo, A. S., Glidewell, L., O'Connor, K., Allen, A.-R., Herrmann-Abell, C. F., Penuel, W. R., Wingert, K., & Lindsay, W. (2022). Promoting shifts in teachers' understanding and use of phenomena in instruction and assessment. In C. Chinn, E. Tan, & Y. Kali (Eds.), *Proceedings of the 16th International Conference of the Learning Sciences - ICLS 2022* (pp. 1145-1148). International Society of the Learning Sciences. https://doi.org/10.22318/icls2022.1145

Wingert, K., Jacobs, J. K., Lindsay, W., **Lo, A. S.**, Herrmann Abell, C. F., & Penuel, W. R. (2022). Understanding the Priorities and Practices of Rural Science Teachers: Implications for Designing Professional Learning. *The Rural Educator*, *43*(3), 26-40. https://doi.org/10.55533/2643-9662.1338

Edelson, D. C., Reiser, B. J., McNeill, K. L., Mohan, A., Novak, M., Mohan, L., Affolter, R., McGill, T. A. W., Buck Bracey, Z. E., Deutch Noll, J., Kowalski, S. M., Novak, D., **Lo, A. S.**, Landel, C., Krumm, A., Penuel, W. R., Van Horne, K., González-Howard, M., & Suárez, E. (2021). Developing Research-Based Instructional Materials to Support Large-Scale Transformation of Science Teaching and Learning: The Approach of the OpenSciEd Middle School Program. *Journal of Science Teacher Education*, *32*(7), 780-804. https://doi.org/10.1080/1046560X.2021.1877457

Fick, S. J., Arias, A. M., Vo, T., Sherwood, C.-A., Benedict-Chambers, A., & **Lo, A. S.** (2020). *Axes of Support: Explicit to Implicit and Practical to Epistemic*. In M. Gresalfi & I. S. Horn (Eds.), *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020* (Vol. 2, pp. 853-854). International Society of the Learning Sciences. https://doi.org/10.22318/icls2020.853

Lo, A. S. (2017). *Epistemic aims, considerations, and agency: Lenses for helping teachers analyze and support students' meaningful engagement in scientific practices* [Dissertation, Northwestern University]. https://doi.org/10.21985/N20R1G

Berland, L. K., Schwarz, C. V., Krist, C., Kenyon, L., **Lo, A. S.**, & Reiser, B. J. (2016). Epistemologies in practice: Making scientific practices meaningful for students. *Journal of Research in Science Teaching*, 53(7), 1082-1112. https://doi.org/10.1002/tea.21257

Lo, A. S. (2014). *Learning to notice: Supporting students' meaningful engagement in scientific practices*. In J. L. Polman, E. A. Kyza, D. K. O'Neill, I. Tabak, W. R. Penuel, A. S. Jurow, K. O'Connor, T. Lee & L. D'Amico (Eds.), *Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014* (Vol. 3, pp. 1754). Boulder, CO: International Society of the Learning Sciences.

Invited Research Talks

Lo, A. S. (2025, February 6). *5D Assessment Project: Supporting Teachers in Designing Assessments that Engage Students' Interests and Identities* [Invited Presentation]. Promoting Equity through Localization and High-Quality Instructional Materials: Bringing Together Practitioners, Researchers, and Designers, Berkeley, CA.

Lo, A. S. (2024, March 26). *Lessons Learned: Preparing Rural Teachers to Design Framework-Aligned Assessment Tasks* [Invited Presentation]. National Academies Science, Engineering, and Medicine K-12 STEM Education and Workforce Development in Rural Areas, Committee Meeting, https://www.nationalacademies.org/event/42056_03-2024_k-12-stem-education-and-workforce-development-in-rural-areas-committee-meeting-3

Panel informed development of NASEM (2024) *K-12 STEM Education and Workforce Development in Rural Areas* report (https://doi.org/10.17226/28269).

Conference Papers and Presentations

Lo, A. S., Klein, E. R., Campanella, M., & Penuel, W. R. (2026, Apr 9). *Supporting Productive Customization of HQIM through Assessment Task Design* [Conference Paper]. 2026 Annual Meeting of the American Educational Research Association, Los Angeles, CA.

Herrmann Abell, C. F., Flanagan, J., **Lo, A. S.**, Deverel-Rico, C., Snowden, J., Brubaker, A., Campanella, M., Lee, D., Olson, P., & Wilson, C. D. (2026, April 22). *Centering Student Voice: Tools for Gathering Experience Data to Inform Science Assessment Design and Practice* [Symposium]. NARST 2026 Annual International Conference, Seattle, WA.

Allen, M., Roehrig, G., **Lo, A. S.**, Klein, E. R., Leifeld, M., Schuchardt, A., & Hick, S. (2026, January 16). *Developing Secondary Science Teacher Leaders' Capacity to Lead for Change* [Conference Paper]. 2026 ASTE International Conference, Chicago, IL.

Lo, A. S., Glidewell, L., Penuel, W. R., & Herrmann Abell, C. F. (2024, Sept 19). *Leveraging the diversity of rural science teachers' contexts to inform the design of assessment professional learning* [Conference Paper]. National Council on Measurement in Education: 2024 Classroom Assessment Conference, Chicago, IL.

Lo, A. S., Glidewell, L., Herrmann-Abell, C., O'Connor, K., Allen, A.-R., Cooper, S. L., Jacobs, J. K., Cherbow, K., Penuel, W. R., Wingert, K., & Gardner, A. (2024, March 18). *Building from Strengths and Attending to Context: Supporting Rural Science Teachers' Learning* [Related Paper Set]. NARST 2024 Annual International Conference, Denver, CO.

Lo, A. S., Cooper, S. L., Herrmann-Abell, C.F., Cherbow, K. & Allen, A. (2024, March 18). *Lessons Learned from Designing 5D Professional Learning for Rural Science Teachers* [Conference Paper]. NARST 2024 Annual International Conference, Denver, CO.

Herrmann-Abell, C. F., **Lo, A. S.**, Cherbow, K., Cooper, S. L., Gardner, A., & O'Connor, K. (2024, March 18). *Investigating the Impact of a 5D Professional Learning Course on Rural Teachers' Assessment Practices* [Conference Paper]. NARST 2024 Annual International Conference, Denver, CO.

Penuel, W. R., & **Lo, A. S.** (2024, March 19). *Preparing Rural Teachers to Design Framework-Aligned Assessment Tasks: Variations in Who Learns and Why* [Conference Paper]. NARST 2024 Annual International Conference, Denver, CO.

Cherbow, K., **Lo, A. S.**, Herrmann-Abell, C. F., Stennett, B., & Askinas, K. (2024, March 19). *Impacting Preservice Teachers' Classroom Practice Through the Development of Coherent Science Teacher Education Experiences* [Conference Paper]. NARST 2024 Annual International Conference, Denver, CO.

Cooper, S. L., & **Lo, A. S.** (2024, March 17). *Supporting Teachers in the Selection of Meaningful Phenomena for Assessment Design* [Conference Paper]. NARST 2024 Annual International Conference, Denver, CO.

Lo, A. S., Bekins, A., Lindsay, W., Martin, A., Newberg, J., Smith, J., Gagnon, R., Knight, J., Knoblock, R., Larm, R., Scott, A., Strode, P., Stennett, B., & Cherbow, K. (2024, Jan 13). *A practitioner's perspective on engaging in cross-stakeholder collaborations to enhance secondary science preservice preparation programs* [Themed Paper Set]. 2024 Association for Science Teacher Education International Conference, New Orleans, LA.

Newberg, J., Smith, J., Gagnon, R., **Lo, A. S.***, & Larm, R. (2024, Jan 13). *Successes and challenges of developing cross-stakeholder collaborations to enhance preservice teacher preparation* [Conference Paper]. 2024 Association for Science Teacher Education International Conference, New Orleans, LA.
**Advised members of the STeLLA CO² University Colorado, Colorado Springs Team, who were writing about their experiences working on the project.*

Lindsay, W., Martin, A., Knight, J., Strode, P., & **Lo, A. S.*** (2024, Jan 13). *Importance of clear roles and shared goals for supporting meaningful collaborations* [Conference Paper]. 2024 Association for Science Teacher Education International Conference, New Orleans, LA.
**Advised members of the STeLLA CO² University Colorado, Boulder Team, who were writing about their experiences working on the project.*

Penuel, W. R., & **Lo, A. S.** (2023, June 30). *Building Ownership and Facilitating Participation in Research among Rural Educators* [Conference Presentation]. 2023 DRK-12 PI Meeting, Washington DC.

McLean, M., Fick, S.J., & **Lo, A.S.** (2023, April) *An Analysis of Supports in OpenSciEd Curriculum Materials Focused on Use of the Crosscutting Concepts* [Conference Presentation]. NARST 2023 Annual International Conference, Chicago, IL.

Lo, A. S., Penuel, W. R., & Wingert, K. (2022). *Supporting Teachers in Designing Assessments Aligned to the Vision of the Framework: Findings from Two Design Studies* [Conference Paper]. 2022 Annual Meeting of the American Educational Research Association, San Diego, CA.

Lo, A. S., Stennett, B., Hvidsten, C., Bekins, A., Gagnon, R., Martin, A., Newberg, J., Slykhuis, D., Smith, J., Strode, P., Foss, G., Lohmann, N., & Roberson, J. (2022, Jan 7). *Lessons Learned: Successes and challenges of fostering cross-stakeholder collaborations to enhance the effectiveness and coherence of secondary science preservice preparation programs* [Related paper set]. Association for Science Teacher Education 2022 International Conference, Greenville, SC.

Lo, A. S., Stennett, B., Hvidsten, C., & Askinas, K. (2021). *Adapting and Scaling the STeLLA PD Program Conceptual Framework in Preservice Teacher Education Programs* [Conference Paper]. NARST 2021 Annual International Conference [Virtual Conference].

Lo, A. S., Stennett, B., Hvidsten, C., & Askinas, K. (2021, Jan 14). *Developing a common vision for supporting coherence in three preservice science teacher education programs* [Conference Paper]. Association for Science Teacher Education 2021 International Conference [Virtual Conference].

Lo, A. S. (2020). *Using cogenerative dialogues to help teachers support meaningful and coherent sensemaking through consensus* [Conference Paper]. NARST 2020 Annual International Conference [Cancelled conference], Portland, OR.

Stennett, B., Hvidsten, C., **Lo, A. S.**, & Slykhuis, D. (2020, Jan 9). *STeLLA CO²: A New Vision for Coherent Science Teacher Preparation* [Conference Paper]. Association for Science Teacher Education 2020 International Conference, San Antonio, TX.

Penuel, W., **Lo, A. S.**, Jacobs, J. K., Gardner, A., Stuhlsatz, M. A. M., & Wilson, C. D. (2019). *Tools for Supporting Teachers to Build Quality 3D Assessment Tasks* [Conference Paper]. NARST 2019 Annual International Conference, Baltimore, MD.

Lo, A. S., Bean, J. R., Oshry, A., Stuhlsatz, M. A. M., & Marshall, C. R. (2019). *Supporting the development of system thinking for explaining global change phenomena* [Conference Paper]. NARST 2019 Annual International Conference, Baltimore, MD.

Lo, A. S. (2016). *Epistemic aims, considerations, and agency: Lenses for helping teachers analyze and enhance students' meaningful engagement in scientific practices* [Conference Paper]. NARST 2016 Annual International Conference, Baltimore, MD.

Griesemer, C. D., & **Lo, A. S.** (2016). *Successes and challenges in promoting student sense making in modeling classrooms* [Conference Paper]. NARST 2016 Annual International Conference, Baltimore, MD.

Lo, A. S. (2015). *Supporting students as epistemic agents and the meaningfulness of their engagement in modeling* [Conference Paper]. NARST 2015 Annual International Conference, Chicago, IL.

Lo, A. S., Krist, C., Reiser, B. J., & Novak, M. (2014). *Examining shifts in teachers' understanding of NGSS and their impact on planned instruction* [Conference Paper]. NARST 2014 Annual International Conference, Pittsburgh, PA.
**This was the first paper to share work related to supporting teachers in developing storylined instructional materials.*

Lo, A. S. (2013). *Understanding differences in student participation in persuasive discourse while engaged in scientific modeling* [Conference Paper]. NARST 2013 Annual International Conference, San Juan, Puerto Rico.

Lo, A. S. (2013). *Examining student attention to epistemologies in practice while evaluating scientific models* [Conference Paper]. 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Reiser, B. J., **Lo, A. S.**, Draney, K., Sussman, J., & Toyama, Y. (2013). *Using assessments to capture students' understanding of epistemologies in practice across content area and time* [Conference Paper]. 2013 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Lo, A. S. (2012, March 25). *Examining the Epistemic Commitments Used in the Evaluation of Scientific Models* [Conference Paper]. NARST 2012 Annual International Conference, Indianapolis, IN.

Baker, R., Blatt, E., Hurwitz, J., **Lo, A. S.** (2003). *How school environment influences students' learning: A look at two magnet schools in the Philadelphia School System* [Conference Paper]. 24th Annual Ethnography in Education Research Forum, Philadelphia, PA.

Posters

Roehrig, G., **Lo, A. S.**, Klein, E. R., Allen, M., Schuchardt, A., Hick, S., & Leifeld, M. (2025, July 14–16). *Developing Teacher Leaders' Capacity to Promote 5D Secondary Science Teaching and Learning* [Conference Poster]. 2025 Noyce Summit, Washington DC.

Lo, A. S., Penuel, W. R., Herrmann-Abell, C. F., Cooper, S., Cherbow, K., Wingert, K., Jacobs, J. K., O'Connor, K., Gardner, A., Glidewell, L., & Allen, A. (2024, March 17). *Preparing Teachers to Design 5D Tasks to Support and Assess Science Learning* [Conference Poster]. NARST 2024 Annual International Conference, Denver, CO.

Stennett, B., **Lo, A. S.**, Herrmann-Abell, C. F., Cherbow, K., & Askinas, K. (2024, March 17). *Communities Supporting Preservice Teacher Learning in Colorado* [Conference Poster]. NARST 2024 Annual International Conference, Denver, CO.

Lo, A. S., Penuel, W. R., & Wingert, K. (2023). *Preparing Teachers to Design 5D Tasks to Support and Assess Science Learning* [Conference Poster]. 2023 DRK-12 PI Meeting, Washington DC.

Lo, A. S. (2015). *Learning to Notice: Supporting students as epistemic agents and meaningful participants in scientific modeling* [Conference Poster]. *Promising Scholarship in Education: Dissertation Fellows and Their Research* at the 2015 Annual Meeting of the American Educational Research Association, Chicago, IL.

Online Forums

Wingert, K., **Lo, A. S.**, & Penuel, W. R. (2021, May 11-18). *Making Aligned Tasks Equitable for Rural Students* [Video]. 2021 National Science Foundation (NSF) STEM for All Video Showcase.
https://stemforall2021.videohall.com/presentations/2097.html (3733 views)

EDUCATOR PROFESSIONAL LEARNING EXPERIENCE

BSCS Science Learning Colorado Springs, CO

Senior Science Educator 2018-Present

- Led the design of the OpenSciEd 6th grade professional learning program to develop teachers' capacity to enact OpenSciEd instructional approach
- Design customized plans for districts and states (MN, NE, and MA) to implement and customize high-quality instructional materials (HQIM). These plans include designing customized scope and sequences, professional learning, materials development, and leadership development.
- Design professional learning workshops to support teachers in using information about their students to design assessments that engage their students' interests and science-linked identities.
- Lead video-based, lesson analysis professional learning to support educators' use of the STeLLA strategies

San Francisco Unified School District San Francisco, CA

Middle School Content Specialist and Instructional Coach 2017-2018

- Designed and facilitated district-wide professional development to support middle school teachers' implementation of district NGSS-aligned science curriculum
- Co-designed professional development for all secondary teacher leaders and science teachers in using video and student artifacts to support productive classroom discourse
- Served as instructional coach for science teachers in high-need middle schools
- Co-designed research instruments to assess the effectiveness of curriculum materials and professional learning in partnership with Stanford University

University of California, Davis, School of Education Davis, CA, USA

Initiative for Innovations in STEM Teaching, Achievement, and Research (I-STAR) 2015-2016

- Developed video-based resources to help K-12 math and science teachers understand the reasoning practices found in the CCSS and the NGSS

Northwestern University, School of Education and Social Policy Evanston, IL, USA

Teaching Assistant 2013-2014

- **Courses**: *MSED 451: Teaching K-12 Science with the Next Generation Science Standards* (Summer 2013) and *LS 435: New Approaches to Science Teaching* (Winter 2014)
- Co-developed tools and processes to help teachers design NGSS-aligned curriculum units using the Next Generation Science Storylines Approach, which later informed the OpenSciEd instructional model
- Involved in all aspects of course design, instruction, planning, and assessment of student work

Instructor, NU-TEACH: Alternative Certification Program 2011-2013

- Facilitated professional development sessions to refine science teachers' attention to student thinking and engage students in authentic scientific inquiry
- Observed and evaluated intern lessons and teaching portfolios
- Facilitated video clubs using video from interns' classrooms

University of Pennsylvania, Graduate School of Education Philadelphia, PA, USA

Consultant, Fieldwork Seminar (EDUC-555) 2005-2008

- Facilitated reflective discussions with student teachers about their practicum experiences.
- Hosted classroom management and routines workshop for student teachers

Wissahickon School District Ambler, PA, USA

- Facilitated professional development sessions to enhance the inclusion of special education students in regular education science classrooms, redesign labs for inquiry, and integrate technology into instructional practice 2005-2007

EDUCATOR PROFESSIONAL LEARNING PRODUCTS

5D Assessment Project

Professional learning workshops and tools to support teachers in designing phenomenon-driven assessments that engaged their interests and science-linked identities as knowers, doers, and users of science. *Regularly facilitated at national and state teacher conferences.

Lo, A. S., & Cooper, S. L. (Eds.). (2022). *Developing 5-Dimensional Assessments of Student Science Learning* [Online Professional Learning Course].

Lo, A. S., & Cooper, S. L. (Eds.). (2024). *5D Assessment Development Tools and Processes.* [Professional Learning Tools]. 5dassessment.org.

Lo, A. S., & Cooper, S. L. (Eds.) (2023*). *Using student interest & identity to design meaningful, phenomenon-driven tasks for students* [Hands-On Workshop].

Lo, A. S. (Ed.) (2024*) *Choosing Phenomena for Standards-Based Assessments that Connect to Students' Interests and Community Priorities* [Hands-On Workshop].

Penuel, W. R., Henson, K., & **Lo, A. S.** (2024, Nov 8). Building Capacity to Design and Use Common Assessments for 5D Science [Hands-On Workshop]. National Science Teachers Association Annual Conference, New Orleans, LA.

Aitken, K., Cooper, S., **Lo, A. S.**, & Novak, D. (2024, March 20). *What makes a high-quality, equitable three-dimensional science assessment and how can you create and use them?* [Professional Learning Institute]. National Science Teachers Association Annual Conference, Denver, CO.

OpenSciEd Professional Learning Materials

Designed materials to develop teachers' capacity to enact OpenSciEd approach to science instruction. All materials can be found at https://www.openscied.org/access-the-pl-materials/.

Lo, A. S., & Lee, S. (2020). *6.1 Light & Matter: Why do we sometimes see different things when looking at the same object? Professional Learning Materials*. OpenSciEd.

Lo, A. S. (2019). *6.2 Thermal Energy: How can containers keep stuff from warming up or cooling down? Professional Learning Materials*. OpenSciEd.

Lo, A. S. (2020). *6.3 Weather, Climate, & Water Cycling: Why does a lot of hail, rain, or snow fall at some times and not others? Professional Learning Materials*. OpenSciEd.

Lo, A. S., & Lee, S. (2021). *6.4 Rock Cycling & Plate Tectonics: What causes Earth's surface to change? Professional Learning Materials*. OpenSciEd.

Lo, A. S., & Lowell, B. R. (2021). *6.5 Natural Hazards: Where do natural hazards happen and how do we prepare for them? Professional Learning Materials*. OpenSciEd.

Lo, A. S., & Lowell, B. R. (2022). *6.6 Cells & Systems: How do living things heal? Professional Learning Materials*. OpenSciEd.

McNeill, K. L., Affolter, R., **Lo, A. S.**, & Novak, M. (Eds.). (2019). *Curriculum Launch: Introducing OpenSciEd's materials and supporting the shift to instruction driven by student sensemaking about phenomena and problems*. OpenSciEd.

McNeill, K. L., Affolter, R., **Lo, A. S.**, & Novak, M. (Eds.). (2020). *Student Sensemaking: Elevating student sensemaking using OpenSciEd's key instructional elements*. OpenSciEd.

McNeill, K. L., Affolter, R., **Lo, A. S.**, & Novak, M. (2020). *Equitable Discussions: Leveraging the rich discussions in OpenSciEd's materials for equitable science learning*. OpenSciEd.

McNeill, K. L., Affolter, R., **Lo, A. S.,** & Novak, M. (Eds.) (2021). *Innovative Assessments: Investigating how OpenSciEd's assessment system focuses on student sensemaking*. OpenSciEd.

McNeill, K. L., Affolter, R., **Lo, A. S.**, & Novak, M. (Eds.) (2021). *Universal Design: Amplifying the Universal Design for Learning features embedded in OpenSciEd's materials*. OpenSciEd.

McNeill, K. L., Affolter, R., **Lo, A. S.**, & Novak, M. (Eds.) (2022). *Making Thinking Visible: Elevating the writing and drawing opportunities for student sensemaking embedded in OpenSciEd's materials*. OpenSciEd.

Workshops to Support Curriculum Implementation and Customization

Lo, A. S., & Leifeld, M. (2026, Apr 16). *Customization of HQIM: How can we strengthen instructional materials for our local context?* [Hands-On Workshop]. National Science Teachers Association Annual Conference, Anaheim, CA.

Lo, A. S., & Leifeld, M. (2025, Nov 13). *Customization of HQIM: How can we strengthen instructional materials for our local context?* [Hands-On Workshop]. National Science Teachers Association Annual Conference, Minneapolis, MN.

Lo, A. S., & Hinyard, B. S. (2025, Nov 6). *Supporting Meaningful Sensemaking using OpenSciEd* [Hands-On Workshop]. 2025 LATM/LSTA Joint Conference, Baton Rouge, LA.

Lo, A. S., Leifeld, M., & Novak, M. (2023, Oct 26). *A Phenomenal Partnership: Considerations for Supporting Customized Curriculum-Based Standards Implementation* [Conference Presentation]. National Science Teachers Association Annual Conference, Kansas City, MO.

Lo, A. S., & Hopkins-Evans, N. (2023, Oct 9). *OpenSciEd Storylines: Supporting Three-Dimensional Learning Linked to Students' Interests, Ideas, and Questions* [Hands-On Workshop]. Pennsylvania Science Teachers Association (PSTA) 2023 Conference: The Wonder of Science, Lancaster, PA.

Novak, M., **Lo, A. S.**, Krehbiel, M., Leifeld, M., & Stretch, E. (2023). *Saint Paul Public Schools, BSCS Science Learning, and OpenSciEd: Collaboration with Impact* [White Paper]. https://bit.ly/SPPSOSE

Edelson, D. C., Reiser, B. J., **Lo, A. S.**, Mills, W., Novak, M., & Novak, D. (2022, April 2). *OpenSciEd Storyline Units: Supporting Three-Dimensional Learning Linked to Students' Interests, Ideas, and Questions [Professional Learning Institute]. National Science Teachers Association Annual Conference, Houston, TX.*

Bean, J.R. & **Lo, A.S**. (2018) *Using the NextGenStorylines Approach to Help Students Understand the Processes of Science and Global Change* [Conference Workshop]. National Association for Biology Teachers Conference, San Diego, CA.

Lo, A.S., & Lewis, E. (2017) *A District's Approach to Implementing the CA-NGSS Integrated Model in Grades 6-8* [Conference Presentation]. 2017 California Science Education Conference, Sacramento, CA.

Lewis, E., & **Lo, A.S.** (2017) *Toolkit for Science Pedagogy: Supporting SFUSD Teachers with the NGSS Shifts* [Conference Presentation]. 2017 California Science Education Conference, Sacramento, CA.

Invited Presentations

Lo, A. S. (2026, April 14). *Taking research to scale: Building Teachers' Capacity to Design Classroom Assessments that Engage their Students' Interests and Identities* [Invited Presentation]. 2026 Council of State Science Supervisors, Anaheim, CA.

Lo, A. S. (2026, March 3). *Using information about students' interests and science-linked identities to design meaningful assessment opportunities for students* [Invited Presentation]. Washington State Science Leadership Lab, Office of Superintendent of Public Instruction.

Lo, A. S. (2025, Oct 7). *Customizing phenomenon-driven assessments to engage students' interests and science-linked identities* [Invited Presentation]. Sharing Localization Models and Resources: A Virtual Session from The Lawrence Hall of Science, Berkeley, CA.

Lo, A. S., & Klein, E. R. (2024, Nov 11). *Customizing OpenSciEd Assessments to Engage Student Interests and Identities* [Invited Hands-On Workshop]. Nexus Academy for Science Curriculum Leadership, New Orleans, LA.

Cooper, S. L., **Lo, A. S.**, & Penuel, W. R. (2023, Dec 7). *Partnering to Improve Coherence and Equity in Systems of Assessment* [Conference Presentation]. Instructionally Relevant Assessment Systems Symposium,

Lo, A. S. (2020, April 9). *Instructional Routines and Strategies to Support Coherent Student Learning* [Invited Keynote]. Nebraska Association for Teachers of Science Virtual UNconference,

Lo, A. S. (2018). *Designing instructional units using the NextGenStorylines Approach to support student sensemaking.* [Webinar] Retrieved from https://nagt.org/nagt/profdev/workshops/ngss_summit/sept2018/index.html

Allen, C., Ciasullo, N., Leach, D., **Lo, A. S.**, Oleksiak, J., Parks, S. (2008). *Your Child is More than a Test Score*. Council for the Advancement of Public Schools, Upper Merion Middle School, King of Prussia, PA, March 27, 2008.

K-12 INSTRUCTIONAL MATERIALS DEVELOPMENT

- **Led 5-year, 1.1M project to develop and implement MN standards-aligned version of OpenSciEd MS curriculum in Saint Paul Public Schools.** Customized units are publicly available at bit.ly/SPPS-OpenSciEdMN.
    - Designed customized versions of existing OpenSciEd units to integrate MN benchmarks not found in the NGSS: Tsunami (MN), Healing (MN), and Everest (MN)
    - Designed new OpenSciEd-style units to address MN standards not found in the NGSS: Digital Communications (MN 8P.4.2.1.2) & Patterns found in periodic table (MN 8P.1.1.1.1)
- **OpenSciEd 6th Grade Unit Writer, Coherence Reviewer, and Professional Learning Designer:** 6.1 One-Way Mirror*, 6.2 Cup Design*, 6.3 Storms, 6.4 Everest*, 6.5 Tsunami*, and 6.6 Healing* units (* earned NGSS Design Badge). All units can be found at openscied.org.
- **Customized New Visions for Public Schools' Earth and Space Science curriculum materials** to integrate OpenSciEd instructional routines for Saint Paul and Minneapolis Public Schools.
- **University of California Museum of Paleontology**: Understanding Global Change Sea Level Rise unit, Designer
- **George Lucas Education Foundation**: AP Environmental Science, Writer
- **San Francisco Unified School District MS Core Science Curriculum**, Writer & Professional Learning Facilitator
- **University of California, Davis**: Model Based Education Resource: Biology, Writer & Professional Learning Facilitator
- **Wissahickon High School**: Honors Physical Science, Lead Designer
- **High Tech High (Mastery Charter High School)**: Earth Science I, Co-Lead Designer

K-12 TEACHING CERTIFICATIONS

- Pennsylvania Instructional II Certification (Biology, Chemistry, & General Science 7-12)
- Qualified Teacher Status with exemption from induction, General Teaching Council for England

K-12 TEACHING EXPERIENCE

Wycombe High School High Wycombe, Buckinghamshire, UK
Teacher of Science 2008-2010

- **Courses Taught**: Key Stage 3 Science; GCSE Biology, Chemistry, and Physics; and AS Biology
- **Pastoral and Classroom Mentor** for 3 PGCE (teacher education) students
- **Evaluation**: Lesson observations rated "outstanding" by internal and external assessors (OFSTED)

Sixth Form Tutor

- Provided pastoral care for 18 students attending post-compulsory education
- Reviewed students' personal statements and wrote university references

Wissahickon High School Ambler, PA, USA
Teacher, Biology and Physical Science 2004-2008

- **Course Taught:** Honors, Academic (college-prep), and Inclusion Biology; Honors Physical Science
- **Leadership:** E-Classroom Pilot Teacher and Trainer
- **Faculty Sponsor**: Student Council, Future Teachers of America, Pennsylvania Junior Academy of Science, Montgomery County Science Research Competition, Delaware Valley Science Fair, & student graduation projects
- Designed department quarterly progress assessments and website

Franklin Towne Charter High School Philadelphia, PA, USA
Teacher, Biology and Physics 2003-2004

High Tech High Philadelphia Charter School (Mastery Charter High School) Philadelphia, PA, USA
Student Teacher, Earth Science 2002-2003

- Co-designed inquiry-based and technology-infused Earth Science I curriculum
- Mentored 8 students through Guardian Angel program, co-sponsored school choir, taught study skills elective
- Designed and maintained science department resource website

K-12 TEACHING HONORS & AWARDS

- Wissahickon High School Alumni Hall of Fame Inductee, 2025
- Certificate of Achievement, Buckinghamshire Children and Young People's Services, July 2010
- Faculty Honoree, Wissahickon High School National Honor Society, March 2008
- Staff Member of the Month, Wissahickon High School, March 2005

PROFESSIONAL AFFILIATIONS

- National Association for Research in Science Teaching
- International Society for the Learning Sciences
- Association for Science Teacher Education
- American Educational Research Association
- National Science Teachers Association
- Pennsylvania Science Teachers Association
- California Science Teachers Association
- Louisiana Science Teachers Association

PROFESSIONAL SERVICE

- Advisory Board Member, New Visions for Public Schools, New York, NY
- Reviewer, Journal of Science Education and Technology
- Reviewer, National Association for Research in Science Teaching
- Alumni Admissions Interviewer, University of Pennsylvania, 2006, 2014-2015