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

PROFESSIONAL SUMMARY

Lo has over 20 years of experience as a researcher, professional learning designer & facilitator, university instructor, and K-12 teacher leader. He is currently a Senior Science Educator at BSCS Science Learning, where he designs and studies the efficacy of research-driven high-quality instructional materials and professional development programs to promote meaningful science learning opportunities for all students. He has led the development of $7.6M in successfully funded research and professional learning projects. He is a teacher at heart and thrives when he has the opportunity to work alongside teachers and students.

EDUCATION

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

- Pre-Doctoral Interdisciplinary Research Training Fellow, Institute of Education Sciences
- American Educational Research Association Minority Dissertation Fellow in Education Research
- **Dissertation:** *Epistemic aims, considerations, and agency: Lenses for helping teachers analyze and support students' meaningful engagement in scientific practices*

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*

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

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

SCIENCE EDUCATION RESEARCH EXPERIENCE

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

- **Project Goal**: Develop and support teacher leaders' capacity to enhance student learning through NGSS-aligned, phenomena-based classroom practices
- Adapt 5D Assessment tools and processes (NSF DRL 2010086) to help teacher leaders customize instruction to better engage students' interests and science-linked identities
- Design and implement workshops to support implementation of new MN standards-aligned curriculum materials at the secondary level.

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

- **Project Goal**: Engage in design-based implementation research to collaboratively design and assess the effectiveness of an online professional learning approach to help rural science teachers design assessments aligned with the NRC (2012) *Framework* vision for meaningful science learning and performance.
- Oversee all aspects of the project research and design work at BSCS Science Learning and our partners at the University of Colorado Boulder.
- Co-led the development and facilitation of the online professional learning course and the scoring and analysis of teachers' pre and post-assessments. All tools and evidence of impact can be found on our project website, 5Dassessment.org.

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

- **Project Goals**: The project will assess the efficacy of the OpenSciEd middle school program and relevant factors for supporting successful implementation.
- Co-lead the adaptation of the 8th grade professional learning materials in partnership with Southern University.
- Lead the exploration of how implementation of OpenSciEd can support engaging, relevant, and coherent student learning.

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, which includes $228,382 supplement)* 2018-2024

- **Project Goal**: This program engaged with stakeholders (university science faculty, university education faculty, and cooperating teachers) to use the STeLLA conceptual framework to enhance the effectiveness and coherence of their undergraduate preservice science teacher (PST) preparation programs.
- Co-designed professional learning to support university team members, PSTs, and PSTs' mentor teachers in learning about the STeLLA strategies.
- Supported the collaborative work of two university teams to use what they learned about STeLLA to enhance their PST programs
- Oversaw the research 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 on our project website, https://bscs.org/STeLLACO2.

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

- **Project Goal:** Developed professional learning materials and tools to support teachers in understanding what meaningful use of the 3Ds looks like and how they can support their students' use of the 3Ds when 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

- **Project Goals**: 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 assess three-dimensionality of teacher-designed assessments and understand how the professional learning led to shifts in 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)

- **Project Goal**: Design and investigate an integrated online resource to support high school biology teachers' enactment and understanding of a year-long model-based instructional sequence
- Developed strategies for data collection, data analysis, curriculum development, and professional development for participating teachers
- Observed and provided professional support for three high school biology teachers' enactment of the curriculum
- Developed methodologies to understand teachers' decision making and planning

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)

- **Project Goal**: Develop a learning progression to characterize how learners' meaningful use of scientific practices can become increasingly more sophisticated over time through instructional, curricular, and professional development supports
- Co-designed protocol and instruments for investigating how teachers perceive the changes involved in bringing NGSS into science classrooms and how they adapt their teaching approaches to support their students' use of scientific practices
- Conducted teacher and student interviews about their understanding and use of scientific practices
- Designed and analyzed assessments used to assess students' understanding and use of 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)

- **Project Goal**: Develop web-based professional development system to help teachers engage with the major ideas within the NRC's Framework for K-12 Science Education and the NGSS.
- Assisted in the design of a middle-school pathway examining students' use of modeling and teacher strategies to support argumentation in classrooms
- Analyzed pre- and post-intervention surveys to ascertain changes in participants' 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., Campanella, M. *, Cherbow, K., Gardner, A., Glidewell, L., Jacobs, J. K., & O'Connor, K. (In revision). Building Teachers' Science Assessment Design Capacity: Results of an Experimental Study of an Online Course for Rural Secondary Educators. [+] Co-equal authorship; *Authorship starting in alphabetical order

Glidewell, L., Jacobs, J. K., Allen, A.-R., Penuel, W. R., & **Lo, A. S.** (in press). A Comparative Case Analysis of Rural Science Teachers' Experiences with Professional Learning. The Rural Educator.

Penuel, W. R., O'Connor, K., Allen, A.-R., Jacobs, J. K., & **Lo, A. S.** (2024). Examining Science Teachers' Conceptions of Student Interest as a Consideration in Designing Assessments. Journal of Science Teacher Education. 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 [+] Co-equal authorship

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. doi: 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.

Conference Papers and Presentations

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. 5dassessment.org/research

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. 5dassessment.org/research

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. 5dassessment.org/research

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. 5dassessment.org/research

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. 5dassessment.org/research

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. bscs.org/STeLLACO2

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. 5dassessment.org/research

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. bscs.org/STeLLACO2

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. bscs.org/STeLLACO2
**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. bscs.org/STeLLACO2
**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. 5dassessment.org

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. http://learndbir.org/resources/tools-for-supporting-teachers-to-build-quality-3d-assessment-tasks

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.

Reiser, B. J., & **Lo, A. S.** (2012). *A framework for supporting and assessing scientific practices* [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

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)

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).

ACADEMIC AWARDS & HONORS

- AERA Minority Dissertation Fellowship in Education Research, 2014-15
- Pre-Doctoral Interdisciplinary Research Training Fellowship, Institute of Education Sciences, 2011-2014
- International Conference for the Learning Sciences Doctoral Consortium, 2014
- AERA 2015 Division C Graduate Student Seminar Participant, 2015
- Dean's Urban Teacher Education Scholar, University of Pennsylvania, 2002-2003
- University Fellowship, Northwestern University, 2010-2011
- Conference Travel Grant, Northwestern University, 2014, 2016

UNIVERSITY TEACHING EXPERIENCE

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
- Involved in all aspects of course design, instruction, planning, and assessment of student work

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

- Conducted professional development sessions with elementary and secondary teachers to refine their attention to student thinking and help their students engage 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

K-16 PROFESSIONAL LEARNING EXPERIENCE

BSCS Science Learning Colorado Springs, CO
Senior Science Educator 2018-Present

- Design and facilitate customized professional learning and coaching to support teachers in implementing standards-aligned instruction and assessment practices
- Develop customized standards implementation plans for districts and states. These plans include designing customized scope and sequences to align with state-specific standards, professional learning, curriculum customization to align with state standards and integrate local phenomena, and leadership development.

- Co-led the design of 5D Assessment professional learning approach and tools to support science teachers in adopting 5D, *Framework* aligned assessment practices that engage their students' interests and identities as knowers, doers, and users of science. Evidence of impact can be found at 5dassessment.org.
    - Design and facilitate customized workshops to support teachers in using designed tools and resources
- Co-led the design of the approach and materials used to support teachers in adopting the OpenSciEd middle school science curriculum.
- Lead video-based, lesson analysis professional learning to support educators' use of the STeLLA strategies and support the coherence of preservice science teacher preparation programs

San Francisco Unified School District San Francisco, CA
Middle School Content Specialist and Instructional Coach 2017-2018

- Designed and enacted district-wide professional development for 6th, 7th, and 8th grade teachers to support the development, implementation, and revision of a NGSS-aligned, middle school science curriculum
- Co-designed professional development for all secondary teacher leaders and science teachers to use video and student artifacts to cultivate cultures of reflective practice and develop strategies for organizing productive classroom discourse
- Served as instructional coach for science teachers in high-need middle schools
- Collaborated with curriculum writers from SFUSD, BSCS, and Stanford to revise curriculum materials
- Co-designed research instruments to assess the effectiveness of curriculum materials and professional learning

University of California, Davis, School of Education Davis, CA, USA
Initiative for Innovations in STEM Teaching, Achievement, and Research (I-STAR) 2015-2016

- **Project Goal**: Develop online resource to help K-12 math and science teachers understand the reasoning practices found in the CCSS and NGSS
- Developed video-based resources to help teachers notice students' use of math and science practices to develop disciplinary ideas: https://www.practices-resource.com/video-cases.html
- Coordinated development of resources and tools to help teachers understand the pedagogical and epistemological shifts involved in supporting practices-centered instruction and facilitate students' use of modeling and argumentation in math and science classrooms.

Northwestern University, School of Education and Social Policy Evanston, IL, USA
Supporting Scientific Practices in Elementary and Middle School Classrooms 2011-2015

- Instructional coach for teachers implementing a NGSS-aligned, middle school science curriculum, *Investigating and Questioning Our World through Science and Technology* (IQWST)
- Designed professional development and instructional interventions to support students' meaningful engagement in scientific practices
- Led district-wide professional development for two high schools (24 teachers) to help teachers understand the shifts required for implementing NGSS and designing NGSS-aligned instructional units

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

PROFESSIONAL LEARNING PRODUCTS

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

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
This was a white paper that was written to share about the planned curriculum adaptation work in Saint Paul Public Schools.

OpenSciEd Professional Learning Materials

I was the lead 6th grade professional learning designer. Grade level professional learning leads were members of the instructional materials design teams and worked together to co-design a model to develop teachers' capacity to enact OpenSciEd instructional approach. Research on teachers' implementation of the curriculum materials and needs informed the design of each round of professional learning.

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. https://www.openscied.org/professional-learning-materials/curriculum-launch/.

McNeill, K. L., Affolter, R., **Lo, A. S.**, & Novak, M. (Eds.). (2020). *Student Sensemaking: Elevating student sensemaking using OpenSciEd's key instructional elements*. OpenSciEd. https://www.openscied.org/professional-learning-materials/student-sensemaking/.

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. https://www.openscied.org/professional-learning-materials/equitable-discussions/

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. https://www.openscied.org/professional-learning-materials/innovative-assessments/

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. https://www.openscied.org/professional-learning-materials/universal-design/

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. https://www.openscied.org/professional-learning-materials/making-thinking-visible/

Each round of professional learning included unit-specific professional learning, where teachers learned how to teach a unit and deepened their understanding of how to use the OpenSciEd approach in their classrooms.

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. https://www.openscied.org/access-the-pl-materials/

Lo, A. S. (2019). *6.2 Thermal Energy: How can containers keep stuff from warming up or cooling down? Professional Learning Materials*. OpenSciEd. https://www.openscied.org/access-the-pl-materials/

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. https://www.openscied.org/access-the-pl-materials/

Lo, A. S., & Lee, S. (2021). *6.4 Rock Cycling & Plate Tectonics: What causes Earth's surface to change? Professional Learning Materials*. OpenSciEd. https://www.openscied.org/access-the-pl-materials/

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. https://www.openscied.org/access-the-pl-materials/

Lo, A. S., & Lowell, B. R. (2022). *6.6 Cells & Systems: How do living things heal? Professional Learning Materials*. OpenSciEd. https://www.openscied.org/access-the-pl-materials/

Invited Talks

Lo, A. S., & Klein, E. R. (2024, Nov 11). Customizing OpenSciEd Assessments to Engage Student Interests and Identities [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* Nebraska Association for Teachers of Science Virtual UNconference.

Lo, A. S. (Producer). (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.

National and State Science Teacher Conference Workshops and Presentations

Lo, A. S., Campanella, M., & Penuel, W. R. (2025, March 28). Choosing Phenomena for Standards-Based Assessments that Connect to Students' Interests and Community Priorities [Hands-On Workshop]. National Science Teachers Association Annual Conference, Philadelphia, PA.

Lo, A. S., Klein, E. R., Campanella, M., & Penuel, W. R. (2024, Nov 8). Choosing Phenomena for Standards-Based Assessments that Connect to Students' Interests and Community Priorities [Hands-On Workshop]. National Science Teachers Association Annual Conference, New Orleans, LA.

Lo, A. S., Klein, E. R., Campanella, M., & Penuel, W. R. (2024, Nov 8). 5D Assessment: Using student interest & identity to design meaningful, phenomenon-driven tasks for students [Hands-On Workshop]. National Science Teachers Association Annual Conference, New Orleans, LA.

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.

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., & Cooper, S. L. (2023, Oct 26). *5D Assessment: Using student interest & identity to design meaningful, phenomenon-driven tasks for students* [Hands-On Workshop]. 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.

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.

DESIGNED K-12 INSTRUCTIONAL MATERIALS

- **OpenSciEd:** 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, ^Writer, +Coherence Reviewer & Professional Learning Designer)
- **Customized OpenSciEd MS units to align with state-specific standards:** Tsunami (MN), Healing (MN), Everest (MN) (Co-Lead)
    - **New Units to Integrate MN Benchmarks**: Digital Signals (MN 8P.4.2.1.2) & Periodic Table (MN 8P.1.1.1.1), Co-Lead
- **University of California Museum of Paleontology**: Understanding Global Change Sea Level Rise unit, Co-Lead
- **San Francisco Unified School District** Middle School Core Science Curriculum, Writer and Professional Learning Designer
- **University of California, Davis**: Model Based Education Resource: Biology, Writer
- **George Lucas Education Foundation**: AP Environmental Science, Writer
- **Wissahickon High School**: Honors Physical Science, Lead
- **High Tech High (Mastery Charter High School)**: Earth Science I, Co-Lead

K-12 TEACHING CERTIFICATIONS

- Pennsylvania Instructional II Certification (Biology, Chemistry, & General Science 7-12)
- California Single-Subject Teaching Credential (Biological Sciences and Chemistry)
- 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

Sixth Form Tutor

- Provided pastoral, academic, and interpersonal advice 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
- American Educational Research Association
- National Science Teachers Association
- Pennsylvania Science Teachers Association
- California 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
- David B. Brownlee Fellow for School of Arts and Sciences Advising, University of Pennsylvania, 2002-2003
- Alumni Admissions Interviewer, University of Pennsylvania, 2006, 2014-2015