

Alexandria K. Hansen

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EDUCATION

PhD	University of California, Santa Barbara STEM Education	June 2018
MA	University of California, Santa Barbara STEM Education	December 2015
Credential	Loyola Marymount University, Los Angeles Secondary Science Teaching Credential (Cleared 2013) Focus in Urban Education	August 2011
BS	University of California, Irvine Biological Sciences Major; Education Minor	June 2010

PROFESSIONAL EXPERIENCE

- Curriculum Designer & Consultant** 2016-present
The Wolf Museum of Exploration and Innovation, Santa Barbara, CA
- Developed K-5, NGSS-aligned summer camp curriculum for an interactive, hands-on science museum.
 - Facilitated summer staff training, oversaw camp operations and frequently co-taught.
- Graduate Student Researcher**, UC Santa Barbara, Department of Education 2016-present
Science and Mathematics Teacher Research Initiative
- Served as lead graduate student on an NSF-funded research project to investigate teacher education programs across 6 University of California campuses.
 - Coordinated data collection efforts across sites; organized incoming data for over 100 preservice teacher participants: inclusive of surveys, interviews, edTPA data and transcripts.
 - Led group meetings to discuss project logistics and analysis of data for presentation at conferences.
- Graduate Student Facilitator**, UC Santa Barbara, California NanoSystems Institute 2013-present
School for Scientific Thought
- Organized and facilitated trainings for STEM graduate students on effective teaching pedagogy.
 - Observed teaching and provided feedback on science lessons taught to high school students.
 - Engaged STEM graduate students in reflective conversations about teaching to improve practice.
- Graduate Student Researcher**, UC Santa Barbara, Department of Education 2016-present
CalTeach: Science & Mathematics Initiative
- Collaborated with faculty to recruit and train prospective STEM undergraduates in teaching pedagogy.
 - Maintained data collection and produced findings in technical reports.

- Graduate Student Researcher**, UC Santa Barbara, Department of Computer Science 2013-2016
Developing Elementary Learning Progressions to Integrate Computational Thinking
- Collaborated with an interdisciplinary team of computer scientists, education researchers, and teachers on a multi-year, NSF-funded project to develop and test a computer science curriculum for upper elementary school students (grades 4-6).
 - Served as lead graduate student, assisted in recruiting schools and training teachers, created curricular materials and co-taught, managed data collection, parsed out research questions in alignment with design-based research methodology, led team meetings to discuss data analysis, and frequently presented findings at research conferences.

- Graduate Student Evaluator**, UC Santa Barbara, California NanoSystems Institute 2014-2015
Center for Science and Engineering Partnerships
- Collaborated with faculty and graduate students in the Mechanical and Chemical Engineering Departments to evaluate an NSF-funded scholarship program to support first generation college students: inclusive of surveys, interviews and focus groups.
 - Produced findings in technical reports to share with the university and funding agency.

TEACHING EXPERIENCE

- Undergraduate Research Supervisor**, UC Santa Barbara, Department of Education 2016-present
ED 199: Independent Study
- Supervised a group of eight undergraduate students, enrolled in the Education minor, on independent research projects of their own choosing and investigation.
 - Held weekly meetings to discuss progress, offered assistance in framing and conducting research, provided feedback on writing-in-progress.

- Teaching Assistant**, UC Santa Barbara, Teacher Education Program 2013-present
Elementary Science Methods
- Assisted an Education faculty member in teaching an elementary science methods course for preservice teacher candidates, focused on designing learning experiences in alignment with the NGSS.
 - Organized and facilitated the first and second annual School Maker Faire in conjunction with UCSB's Teacher Education Program to expose teacher candidates to informal learning strategies and engage the community in creative making to learn science and engineering.

- Masters of Education (M.Ed.) Facilitator**, UC Santa Barbara, Teacher Education Program 2013-2015
- Supervised elementary and secondary preservice teacher candidates' Masters of Education work.
 - Held weekly meetings to discuss progress, reviewed candidates' work, and mentored candidates as they collected, analyzed, and theoretically framed their research.

- Computer Science Instructor**, Santa Barbara & Oxnard, CA 2013-2016
Kids Engaged in Learning Programming and Computer Science (KELP-CS)
- Developed and taught computer science curriculum for 4th-6th grade students using a block-based programming environment, adapting instruction to better meet the needs of the large population of English learners.

- Lego Engineering Instructor**, Ventura, CA 2013-2014
Play-Well TEKnologies
- Designed learning experiences for K-8 students to encounter engineering concepts and practice design thinking using Lego materials in after-school classes and summer camps.

Middle School Science and Math Teacher, Los Angeles, CA
California Academy for Liberal Studies Charter Middle School

2010-2013

- Developed curriculum and taught sixth, seventh, and eighth grade science and mathematics.
- Used standards-based grading and assessments to plan individualized instruction, resulting in over 90% of student scoring proficient and advanced in second year of teaching.
- Measured “Highly Effective” on the school’s teacher effectiveness rubric and evaluation system— inclusive of student growth, curriculum design, observations, and feedback from parents, students, colleagues, and school leaders.

Corps Member, Teach for America

2010-2012

- Selected from approximately 40,000 applicants nationwide to join a national teacher corps of recent-college graduates and professional who commit two years to teach in under-resourced public schools.
- Engaged in ongoing professional development activities, including seminars, discussion groups, workshops, readings, and “learning teams” specific to science education.

PUBLICATIONS

Hansen, A.K., Hansen, E.R., Hall, T., Fixler, M., Harlow, D. (In Press). Fidgeting with fabrication: Students with ADHD making tools to focus. Submitted to *FabLearn: Conference on Creativity and Fabrication in Education* (FabLearn '17). Palo Alto, CA: ACM.

Harlow, D.B. & **Hansen, A.K.** (In Press). School Maker Faires as Preservice Teacher Education. Submitted to *Science & Children*.

Harlow, D.B., Dwyer, H.A., **Hansen, A.K.**, Iveland, A., Franklin, D. (In Press). Ecological design based research for computer science education: Affordances and effectivities for elementary school students. Submitted to *Cognition and Instruction*.

Arya, D., Harlow, D.B., **Hansen, A.K.**, Harmon, L., McBeath, J.K., Pulgar, J. (2017). Innovative youth: An engineering and literacy integrated approach. *Science Scope*, 40(9), 82-88.

Gribble, J., **Hansen, A.K.**, Harlow, D.B., Franklin, D. (2017). Cracking the code: The impact of computer coding on the interactions of a child with autism. In *Proceedings of the 16th International Conference on Interaction Design and Children* (IDC '17). Palo Alto, CA: ACM.

Hansen, A.K., Dwyer, H.A., Iveland, A., Talesfore, M., Wright, L., Harlow, D.B., Franklin, D. (2017). Assessing children’s understanding of the work of computer scientists: The draw-a-computer scientist test. In *Proceedings of the 48th Technical Symposium on Computer Science Education* (SIGCSE '17). Seattle, WA: ACM.

Franklin, D., Skifstad, G., Rollock, R., Mehrota, I., Ding, V., **Hansen, A.K.**, Weintrop, D., Harlow, D.B. (2017). Using upper-elementary student performance to understand conceptual sequencing in a blocks-based curriculum. In *Proceedings of the 48th Technical Symposium on Computer Science Education* (SIGCSE '17). Seattle, WA: ACM.

O’Brien, S., **Hansen, A.K.**, Harlow, D.B. (2016). Educating teachers for the maker movement: Pre-service teachers’ experiences facilitating maker activities. In *Proceedings of FabLearn: Conference on Creativity and Fabrication in Education* (FabLearn '16). Palo Alto, CA: ACM.

- Hansen, A.K.**, Harlow, D.B. (2016). Making and breaking bones: Learning physics through engineering design. In *Proceedings of the Physics Education Research Conference (PERC '16)*. Sacramento, CA.
- Hansen, A.K.**, Iveland, A., Carlin, C., Franklin, D., Harlow, D.B. (2016). User-centered design in block based programming: Developmental and pedagogical considerations for children. In *Proceedings of the 15th International Conference on Interaction Design and Children (IDC '16)*. Manchester, UK: ACM.
- Hansen, A.K.**, Hansen, E.R., Dwyer, H.A., Harlow, D.B., Franklin, D. (2016). Differentiating for diversity: Using universal design for learning in computer science education. In *Proceedings of the 47th Technical Symposium on Computer Science Education (SIGCSE '16)*. Memphis, TE: ACM.
- Franklin, D., Dwyer, H.A., Hill, C., **Hansen, A.K.**, Harlow, D.B. (2016). Initialization in scratch: Seeking knowledge transfer. In *Proceedings of the 47th Technical Symposium on Computer Science Education (SIGCSE '16)*. Memphis, TE: ACM.
- Franklin, D., Harlow, D.B., Dwyer, H., Hill, C., Iveland, A., **Hansen, A.K.** (2016). *Kids Engaged in Learning Programming and Computer Science (KELP-CS), Module 2: Game Design*. Retrieved online from <http://people.cs.uchicago.edu/~dmfranklin/kelpcs/educators/KELPCSMModule1and2.pdf>.
- Harlow, D.B., Dwyer, H.A., **Hansen, A.K.**, Hill, C., Iveland, A., Leak, A., Franklin, D. (2015). Computer programming in elementary and middle school: Connections across content. In M. Urban and D. Falvo (Eds.) *Improving K-12 STEM educational outcomes through technological integration*, 337-361. Hershey, PA: IGI Global.
- Hansen, A.K.**, Iveland, A., Dwyer, H.A., Franklin, D., Harlow, D.B. (2015). Programming science digital stories: Computer science and engineering design in the science classroom. *Science and Children*, 53(3), 60-64.
- Harlow, D.B., **Hansen, A.K.** (2015). Balancing collaborative and individual work: An example of maker education through mechatronics. In *Proceedings of FabLearn: Conference on Creativity and Fabrication in Education (FabLearn '15)*. Palo Alto, CA: ACM.
- Dwyer, H.A., Hill, C., **Hansen, A.K.**, Iveland, A., Franklin, D., Harlow, D.B. (2015). How students read block-based programs: Predictions, visual cues, and affordances. In *Proceedings of the International Conference on Computer Education Research (ICER '15)*. Omaha, NE: ACM.
- Hansen, A.K.**, Dwyer, H.A., Hill, C., Iveland, A., Martinez, T., Harlow, D.B., Franklin, D. (2015). Interactive design by children: A construct map for programming. In *Proceedings of the 14th International Conference on Interaction Design and Children (IDC '15)*. Boston, MA: ACM.
- Franklin, D., Hill, C., Dwyer, H., Martinez, T., Iveland, A., **Killian, A.**, Harlow, D.B. (2015). Getting started in teaching and researching computer science in the elementary classroom. In *Proceedings of the 46th Technical Symposium on Computer Science Education*. Kansas City, MO: ACM.
- Franklin, D., Harlow, D.B., Dwyer, H., Henken, J., Hill, C., Iveland, A., **Killian, A.** (2014). *Kids Engaged in Learning Programming and Computer Science (KELP-CS), Module 1: Digital Storytelling*. Retrieved online from <https://discover.cs.ucsb.edu/kelpcs/educators/KELPCSIntro.pdf>.

Manuscripts under review:

- Hansen, A.K.**, McBeath, J.K., Harlow, D.B. (Under review). No bones about it: How digital fabrication changes student perceptions of their role in the classroom. Submitted to the *Journal of Pre-College Engineering*.
- Harlow, D.B., **Hansen, A.K.**, McBeath, J., Leak, A.E. (Under review). Teacher education for maker education: Helping teachers develop appropriate PCK for engaging children in educative making. *Invited book chapter*.
- Harlow, D., **Hansen, A.K.**, McLean, M. (Under review). “Making” thinking visible: How preservice elementary school teachers design science assessments to align with maker-ed activities. Submitted to *Science Education*.
- Carpenter, S., Iveland, A., Moon, S., **Hansen, A.K.**, Bianchini, J.A., Harlow, D.B. (Under review). “Models are a metaphor in your brain”: How prospective, preservice, and practicing teachers understand the science and engineering practice of modeling. Submitted to the *Journal of Research in Science Teaching*.
- Hansen, A.K.**, Harlow, D.B. (Under review). “That’s engineering, right?”: Preservice teachers’ design and facilitation of activities at a Maker Faire. Submitted to the *American Educational Research Association Annual Conference (AERA ’18)*. New York, NY.
- Weintrop, D., **Hansen, A.K.**, Harlow, D.B., Franklin, D. (Under review). Bringing computer science into elementary classrooms. Submitted to the *American Educational Research Association Annual Conference (AERA ’18)*. New York, NY.
- Hansen, A.K.**, Carpenter, S., Bianchini, J., Stone, E., Forbes, C. (Under review). Preparing reform-minded science and mathematics teachers: An empirical investigation across six teacher education programs. Submitted to the *National Association for Research in Science Teaching Annual Conference (NARST ’18)*. Atlanta, GA.
- Moon, S., **Hansen, A.K.**, Bushong, L., Carpenter, S., Bianchini, J. (Under review). Examining the effects of teacher education on preservice science and mathematics teacher readiness. Submitted to the *National Association for Research in Science Teaching Annual Conference (NARST ’18)*. Atlanta, GA.
- Weintrop, S., **Hansen, A.K.**, Rolock, R., Ma, Z., Harlow, D.B., Franklin, D. (Under review). How students control program execution in scratch-style programming environments. Submitted to the *48th Technical Symposium on Computer Science Education (SIGCSE ’18)*. Baltimore, MD: ACM.

PRESENTATIONS

- Gribble, J., **Hansen, A.K.**, Harlow, D.B., Franklin, D. (2017, June). Cracking the code: The impact of computer coding on the interactions of a child with autism. Paper presented at the *International Conference on Interaction Design and Children (IDC ’17)*. Palo Alto, CA.
- Hansen, A.K.**, Harlow, D.B. (2017, April). Understanding engineering design in the context of making: Teacher and student perceptions of design thinking in a classroom maker activity. Paper presented at the annual meeting of the *American Educational Research Association (AERA ’17)*. San Antonio, TX.

- Hansen, A.K.**, Hansen, E., Iveland, A., Gribble, J., Moran, A., Harlow, D.B., Franklin, D. (2017, April). Understanding the challenges and potential of computer science education for elementary school students with disabilities. Paper presented at the annual meeting of the *American Educational Research Association* (AERA '17). San Antonio, TX.
- Hansen, A.K.**, Moon, S., Iveland, A., Carpenter, S., Harlow, D.B., Bianchini, J. (2017, April). Understanding the practices of science and engineering: Perceptions of teachers across the learning-to-teach continuum. Paper presented at the annual meeting of the *National Association for Research in Science Teaching* (NARST '17). San Antonio, TX.
- O'Brien, S., **Hansen, A.K.**, Harlow, D.B. (2016, October). Educating teachers for the maker movement: Pre-service teachers' experiences facilitating maker activities. Paper presented at *FabLearn: Conference on Creativity and Fabrication in Education* (FabLearn '16). Palo Alto, CA.
- Hansen, A.K.**, Harlow, D.B. (2016, July). Making and breaking bones: Learning physics through engineering design. Paper presented at the annual meeting of the *Physics Education Research Conference* (PERC '16). Sacramento, CA.
- Harlow, D.B., **Hansen, A.K.** (2016, July). From rich points to research questions: Building research questions from observational data. Invited panel discussion at the *Physics Education Research Conference* (PERC '16). Sacramento, CA.
- Hansen, A.K.**, Iveland, A., Carlin, C., Franklin, D., Harlow, D.B. (2016, June). User-centered design in block based programming: Developmental and pedagogical considerations for children. Paper presented at the *International Conference on Interaction Design and Children* (IDC '16). Manchester, UK.
- Hansen, A.K.**, Dwyer, H.A., Harlow, D.B., Franklin, D. (2016, April). What is a computer scientist? Developing the draw-a-computer-scientist test for elementary school students. Paper presented at the annual meeting of the *American Educational Research Association* (AERA'16). Washington, DC.
- Hansen, A.K.**, McBeath, J.K., Harlow, D.B. (2016, April). Making meaning of making: Using CHAT to understand digital fabrication in the classroom. Paper presented at the annual meeting of the *American Educational Research Association* (AERA'16). Washington, DC.
- Hansen, A.K.**, Hansen, E.R., Dwyer, H.A., Harlow, D.B., Franklin, D. (2016, March). Differentiating for diversity: Using universal design for learning in computer science education. Paper presented at the *Technical Symposium on Computer Science Education* (SIGCSE '16). Memphis, TE.
- Franklin, D., Dwyer, H.A., Hill, C., **Hansen, A.K.**, Harlow, D.B. (2016, March). Initialization in scratch: Seeking knowledge transfer. Paper presented at the *Technical Symposium on Computer Science Education* (SIGCSE '16). Memphis, TE.
- Hansen, A.K.**, Harlow, D.B. (2016, January). Creating equitable and accessible computer science experiences for children. Paper presented at the *American Educational Research Association-UC Santa Barbara STEM Education Conference*. Santa Barbara, CA.
- Harlow, D.B., **Hansen, A.K.** (2015, September). Balancing collaborative and individual work: An example of maker education through mechatronics. Paper presented at *FabLearn: Conference on Creativity and Fabrication in Education* (FabLearn '15). Palo Alto, CA.

- Hansen, A.K.**, Dwyer, H.A., Hill, C., Iveland, A., Martinez, T., Harlow, D.B., Franklin, D. (2015, June). Interactive design by children: A construct map for programming. Paper presented at the *International Conference on Interaction Design and Children (IDC '16)*. Boston, MA.
- Dwyer, H.A., **Hansen, A.K.**, Iveland, A., Hill, C., Franklin, D., Harlow, D.B. (2015, April). Programming languages and discourse: Investigating the linguistic context in learning computer science during elementary school. Paper presented at the annual meeting of the *American Educational Research Association (AERA'15)*. Chicago, IL.
- Hansen, A.K.** (2015, March). Interviewing children. Workshop for student in the Gevirtz Graduate School of Education, UC Santa Barbara, CA.
- Killian, A.**, Templton, J. (2012). Fostering a growth mindset. Professional development workshop for middle school teachers of Partnerships to Uplift Communities (PUC) charter schools. Los Angeles, CA.
- Killian, A.** (2012). Increasing student engagement in the classroom. Professional development workshop for middle school teachers of Partnerships to Uplift Communities (PUC) charter schools. Los Angeles, CA.
- Killian, A.** (2012). Creating rigorous assessments in the science classroom. Professional development workshop for science teachers of Teach for America, Los Angeles, CA.
- Killian, A.** (2011). Planning 101: Creating unit plans and year-long plans. Professional development workshop for science teachers of Teach for America, Los Angeles, CA.

TECHNICAL REPORTS

- Hansen, A.K.** & Lenaburg, L. A. (2015). Enhanced support, training and experiences for engineering majors (ESTEEM): Annual evaluation report.
- Hansen, A.K.** & Lenaburg, L. A. (2015). Engineering Ethics Evaluation, Mechanical & Chemical Engineering Departments. Submitted to the National Science Foundation.

SERVICE

Community

- Science nights at local schools**, Volunteer, 2013-present
- Goleta Boys and Girls Club**, STEM-project lead and volunteer, 2015-2016
- Isla Vista Teen Center**, STEM-project lead and volunteer, 2014-2015
- Teach for America**, Corps Member, 2010-2012
- Reading is Fundamental**, Volunteer, 2008-2010
- THINK Together**, Volunteer, 2009-2010

University and Department: UC Santa Barbara

- Leadership team**, School Maker Faire, 2015-present
- Mentor** for incoming graduate students, 2015-present
- Vice President of Internal Relations**, Graduate Student Association of Education, 2015-2016
- Volunteer**, Job search committee, 2016
- Panelist**, Roundtable for incoming graduate students, 2014-2016

Professional Organizations

American Association of Physics Teachers (AAPT), Member, 2016-present

Physics Education Research Conference (PERC), Member and reviewer, 2016-present

Association for Computing Machinery (ACM), Member and reviewer, 2015-present

Interaction Design and Children (IDC), Reviewer, 2016-present

National Science Teacher's Association (NSTA), Member and reviewer, 2015-present

Science and Children, Reviewer, 2016-present

American Educational Research Association (AERA), Member and reviewer, 2014-present

Division C: Learning and Instruction

Division K: Teacher Education

HONORS & AWARDS

Dennis R. Washington Graduate Student Fellowship, Horatio Alger Association, 2016-2018

Dissertation Fellowship, UC Santa Barbara, 2017-2018

Conference Travel Grant Award, UC Santa Barbara, 2014-2017

Block Grant Award, UC Santa Barbara, 2014-2016

Order of Omega Honor Society, UC Irvine, 2010

Dean's Honor List, UC Irvine, 2007-2009

Chancellor's Excellence Scholarship, UC Irvine, 2006-2008