Alexandria Killian 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 learning across 6 different University of California campuses.
- Coordinated data collection efforts across sites with 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 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 disucss 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 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 8 undergraduate students minoring in Education in independent research projects.
- 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 which focused on designing learning experiences in alignment with the NGSS.
- Organized and facilitated the first 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 content.

Masters of Education (M.Ed.) Facilitator, UC Santa Barbara, Teacher Education Program 2013-2015

- Supervised elementary and secondary pre-service 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 4^{th}-6^{th} 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 2010-2013
California Academy for Liberal Studies Charter Middle School

- 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.
- Founded a student government organization dedicated to service, which developed a school-wide recycling program, holiday toy drive, Pennies for Patients campaign, and monthly video announcements.

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

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. (In Press). Innovative youth: An engineering and literacy integrated approach. Submitted to *Science Scope.*

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/KELPCSModule1and2.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.

Publications currently under review:

Hansen, A.K., McBeath, J.K., Harlow, D.B. (Under review). No bones about it: How digital fabrication changes student perception of their role in the classroom. Submitted to the *Journal of Pre-College Engineering*.

Hansen, A.K., Hanen, E., Hall, T., Fixler, M., Harlow, D.B. (Under review). Fidgeting with fabrication: Students with ADHD making tools to focus. Submitted to *FabLearn: Conference on Creativity and Fabrication in Education* (FabLearn '17).

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).

Weintrop, D., **Harlow, A.K**., Franklin, D. (Under review). Bringing computer science into elementary classrooms. Submitted to the *American Educational Research Association* Annual Conference (AERA '18).

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.*

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 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 A merican 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, 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, 2006-2008