HILARY A. DWYER

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EDUCATION

Ph.D.	**University of California (UC), Santa Barbara**	**2014**
	Teaching and Learning: Mathematics Education	Santa Barbara, CA
	Doctoral Emphasis in Feminist Studies	

"You Must Be Smart:" Intersections among Gender, Ethnicity, and Degree Type in the Lives of University Mathematics Majors

Yukari Okamoto (Chair), Mary E. Brenner, Julie Bianchini, & Barbara Herr Harthorn

M.A.	**University of California, Santa Barbara**	**2011**
	Teaching and Learning: Mathematics Education	Santa Barbara, CA
B.S.	**Fairfield University**	**2006**
	Mathematics Major, Biology Minor	Fairfield, CT

PROFESSIONAL APPOINTMENTS

Postdoctoral Research Associate, ATLAS Institute, University of Colorado, Boulder, 2016 – present

Research Associate, Education Development Center, Center for Children and Technology, 2014 – present

Educational Technology Coordinator, Lower Campus (Grades 4 – 8), Ojai Valley School, 2015 – 2016

Postdoctoral Research Associate, UC Santa Barbara, Department of Computer Science and Department of Education, 2014-2015

HONORS & AWARDS

Gevirtz Fellowship, UC Santa Barbara, Department of Education, 2012 - 2014

Block Grant Award, UC Santa Barbara, Department of Education, 2013

Special Regent's Fellowship, UC Santa Barbara, 2008 - 2012

Graduate Student Conference Scholarship, American Educational Research Association (AERA) SIG for Research on Women in Education, 2012

Award for Outstanding Achievement in Mathematics, Fairfield University, 2006

Phi Beta Kappa (National Academic Honor Society), Fairfield University, 2006

Presidential Scholarship, Fairfield University, 2002 – 2006

Dean's Scholar, Fairfield University, 2002 - 2006

PUBLICATIONS

[14] Hansen, A., **Dwyer, H.**, Hansen E., Franklin, D., & Harlow, B. H. (2016). Differentiating for diversity: Using universal design for learning in K-6 computer science education. In *Proceedings of the 47th Technical Symposium on Computer Science Education (SIGCSE '16)*. Memphis, TN: ACM.

[13] Franklin, D., Hansen, A. K., Hill, C., **Dwyer, H. A.**, & Harlow, D. (2016). Initialization in Scratch: Seeking knowledge transfer. In *Proceedings of the 47th Technical Symposium on Computer Science Education (SIGCSE '16)*. Memphis, TN: ACM.

[12] Harlow, D., **Dwyer, H. A.,** Hansen, A. K., Hill, C., Iveland, A., Leak, A. E., & Franklin, D. (2016). Computer programming in elementary and middle school: Connections across content. In D. Falvo & M. Urban (Eds.), *Improving K-12 STEM education through technological integration* (pp. 340-365). Hershey, PA: IGI Global.

[11] Killian, A., Iveland, A., **Dwyer, H. A.**, Harlow, D., & Franklin, D. (2015). Programming science digital stories: Computer science and engineering design in the science classroom. *Science and Children, 53*(3), 60-64.

[10] **Dwyer, H. A.**, Hill, C., Hansen, A., Iveland, A., Franklin, D, & Harlow, D. (2015). Fourth grade students reading block-based programs: Predictions, visual cues, and affordances. In *Proceedings of the 11th Annual International Conference on International Computing Education Research (ICER '15)*. Omaha, NE: ACM.

[9] Hansen, A. K., **Dwyer, H. A.**, Hill, C., Iveland, A., Martinez, T., Harlow, D., & Franklin, D. (2015). Interactive design by children: A construct map for programming. In *Proceedings of the 14th International Conference on Interaction Design & Children (IDC '15)*. Boston, MA: ACM.

[8] Bianchini, J. A., **Dwyer, H. A.**, Brenner, M. E., & Wearly, A. (2015). Facilitating science and mathematics teachers' talk about equity: What are the strengths and limitations of each? *Science Education, 99*(3), 577-610.

[7] Hill, C., **Dwyer, H. A.**, Martinez, T., Harlow, D., & Franklin, D. (2015). Floors and flexibility: designing a programming environment for 4th – 6th grade classrooms. In *Proceedings of the 46th Technical Symposium on Computer Science Education (SIGCSE '15)*. Kansas City, MO: ACM.

[6] Franklin, D., Hill, C., **Dwyer, H. A**., Martinez, T., Iveland, A., Killian, A., & Harlow, D. (2015). Getting started in teaching and researching computer science in the elementary classroom. In *Proceedings of the 46th Technical Symposium on Computer Science Education (SIGCSE '15)*. Kansas City, MO: ACM.

[5] Franklin, D., Harlow, D., **Dwyer, H. A**., Henkens, J., Hill, C., Iveland, A., Killian, A., & Development Staff. (2014). *Kids Enjoying Learning Programing (KELP-CS) – Module 1 Digital Storytelling. A computer science curriculum for elementary school students*. Available at https://discover.cs.ucsb.edu/kelpcs/educators

[4] **Dwyer, H. A.,** Hill, C., Carpenter, S., Harlow, D., & Franklin, D. (2014). Identifying elementary students' pre-instructional ability to develop algorithms and step-by-step instructions. In *Proceedings of the 45th Technical Symposium on Computer Science Education (SIGCSE '14).* Atlanta, GA: ACM.

[3] **Dwyer, H. A.**, Boe, B., Hill, C., Franklin, D., & Harlow, D. (2014). Computational thinking for physics: programming models of physics phenomenon in elementary school. In *Proceedings of the 2013 Physics Education Research Conference (PERC '13).* Melville, NY: AIP Conference Proceedings.

[2] Harlow, D., Bianchini, J., Swanson, L., & **Dwyer, H. A**. (2013). Potential teachers' appropriate and inappropriate application of pedagogical resources in a model-based physics course: A "knowledge in pieces" perspective on teacher learning. *Journal of Research in Science Teaching, 50*(9), 1098 - 1126.

[1] Harlow, D., Swanson, L., **Dwyer, H. A.**, & Bianchini, J. (2010). Learning pedagogy in physics. *Proceedings of the 2010 Physics Education Research Conference (PERC '10).* Melville, NY: AIP Conference Proceedings.
    • Finalist for best paper award

Manuscripts In Progress

Brenner, M. E., Bianchini, J. A., & **Dwyer, H. A.** (Under review). Working toward equity through teacher research: changes in mathematics and science teachers' views and practices.

Harlow, D., **Dwyer, H. A.**, Hansen, A. K., Iveland, A., & Franklin, D. (Under review). Ecological design-based research for computer science education: Affordances and effectivities for elementary school students.

Dwyer, H. A., Harlow, D., Iveland, A., Killian, A., Hill, C., & Franklin, D. (Under review). Investigating the linguistic context around learning computer science in elementary school.

PRESENTATIONS

[21] Hansen, A. K., **Dwyer, H. A.,** Harlow, D. B., & Franklin, D. (2016, April). *What is a computer scientist? Developing a draw-a-computer-scientist-test for elementary school students*. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Washington, DC.

[20] Hansen, A. K., Hansen E., **Dwyer, H. A.**, Franklin, D., & Harlow, B. H. (2016, March). Differentiating for diversity: Using universal design for learning in K-6 computer science education. Paper presented at annual meeting of the *Technical Symposium on Computer Science Education (SIGCSE '16),* Memphis, TN: ACM.

[19] Franklin, D., Hansen, A. K., Hill, C., **Dwyer, H. A.**, & Harlow, D. (2016, March). Initialization in Scratch: Seeking knowledge transfer. Paper presented at the *47th Technical Symposium on Computer Science Education (SIGCSE '16),* Memphis, TN: ACM.

[18] **Dwyer, H. A.**, Hill, C., Hansen, A., Iveland, A., Franklin, D, & Harlow, D. (2015). Fourth grade students reading block-based programs: Predictions, visual cues, and affordances. Paper presented at the *11th Annual International Conference on International Computing Education Research (ICER '15)*, Omaha, NE.

[17] **Dwyer, H. A**., Iveland, A., Killian, A., Hill, C., Franklin, D., & Harlow, B. H. (2015, April). *Programming languages and discourse: investigating the linguistic context in learning computer science during elementary school*. Poster presented at the Annual Meeting of the American Educational Research Association (AERA), Chicago, IL.
  • Finalist for Division C Poster Award

[16] Hill, C., **Dwyer, H. A.**, Martinez, T., Harlow, D., & Franklin, D. (2015, March). *Floors and flexibility: designing a programming environment for 4th – 6th grade classrooms.* Paper presented at the 46th ACM Technical Symposium on Computer Science Education (*SIGCSE* '15), Kansas City, MO.

[15] Franklin, D., Hill, C., **Dwyer, H. A.**, Martinez, T., Iveland, A., Killian, A., & Harlow, D. (2015, March). *Getting started in teaching and researching computer science in the elementary classroom.* Paper presented at the 46th ACM Technical Symposium on Computer Science Education (*SIGCSE* '15), Kansas City, MO.

[14] **Dwyer, H. A.,** Wearly, A., Bianchini, J. A., & Brenner, M. E. (2014, April). *Science and mathematics teachers' reflections on a multifaceted approach to equity professional development.* Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (NARST), Pittsburgh, PA.

[13] Brown, T., **Dwyer, H. A.**, & Wearly, A. (2014, April). *Virtual group-mentoring of early career women scholars: A developmental networks approach.* Paper presented at the Annual Meeting of the American Educational Research Association (AERA), Philadelphia, PA.

[12] **Dwyer, H. A.**, Hill, C., Iveland, A. & Franklin, D. (2014, April). *Coding with Scratch and Octopi.* Professional development workshop for teachers in the Ventura County Science Technology Engineering, Arts, and Mathematics Network (VC-STEM-N), Ventura, CA.

[11] **Dwyer, H. A.,** Hill, C., Carpenter, S., Harlow, D., Franklin, D. (2014, March). *Identifying elementary students' pre-instructional ability to develop algorithms and step-by-step instructions.* Paper presented at the 45th ACM Technical Symposium on Computer Science Education (SIGCSE), Atlanta, GA.

[10] **Dwyer, H. A.** (2014, February). *Understanding the intersection of gender, ethnicity, and math in the lives of math majors.* Presentation for undergraduate students in mathematics, Santa Barbara, CA.

[9] **Dwyer, H. A.** (2014, January). *The ethics of interviewing.* Workshop for students in Gevirtz Graduate School of Education, Santa Barbara, CA.

[8] Franklin, D., & **Dwyer, H. A.** (2014, January). *Computer science (CS) in elementary schools.* Roundtable discussion at the National Science Foundation STEM-C Partnerships (CE21) Principal Investigator and Community Meeting, Orlando, FL.

[7] **Dwyer, H**. **A**., & Harlow, D. (2013, July). *Using intersectionality to investigate students' affective reactions to college mathematics.* Presentation at the Annual Meeting of the American Association of Physics Teachers (AAPT), Portland, OR.

[6] **Dwyer, H. A.**, Boe, B., Hill, C., Franklin, D., & Harlow, D. (2013, July). *Computational thinking for physics: Programming models of physics phenomenon in elementary school.* Poster presented at the Physics Education Research Conference (PERC), Portland, OR.

[5] Bianchini, J., Iveland, A., Stewart, E. A., & **Dwyer, H**. **A.** (2013, April). *Potential science teachers' understanding of students: Contrasts by gender, ethnicity, language and major.* Paper presented at the National Association for Research in Science Teaching Conference (NARST), Rio Grande, Puerto Rico.

[4] **Dwyer, H. A**., Brown, T. M., & Wearly, A. (2012, October). *Fostering a network of support: Peer mentoring across the great divide.* Panel discussion presented at the AERA Research on Women in Education Fall Conference (RWE), Coeur d'Alene, ID.

[3] **Dwyer, H**. **A.** (2011, November). *Qualitative research technology workshop 1: Using Express Scribe and transcription pedals for audio and video data.* Workshop for students in Gevirtz Graduate School of Education, Santa Barbara, CA.

[2] Harlow, D., Swanson, L., **Dwyer, H**. **A.**, & Bianchini, J. (2011, April*). Integrating pedagogy and content in an undergraduate physics course: What was learned?* Paper presented at the Annual Meeting of the National Association for Research in Science Teaching (NARST), Orlando, FL.

[1] Harlow, D., Swanson, L., **Dwyer, H**. **A.**, Emerson, A, Moon, S. (2010, July). *Learning about teaching and learning in PET.* Paper presented at the Annual Meeting of American Association of Physics Teachers (AAPT), Portland, OR.

RESEARCH EXPERIENCE

Postdoctoral Research Associate, University of Colorado - Boulder, ATLAS Institute, 2016 - present
- Investigated the ways middle school students and teachers learned key concepts in physical computing through a hands-on, music theory curriculum in typical classroom settings.
- Examined how computing, computer science and programming can be better integrated into larger K-12 STEAM education initiatives.
- Collected data at local schools, developed curricular, professional development, and technology materials, analyzed data, and managed manuscript and proposal submissions.

Research Associate, Education Development Center (EDC), Center for Children and Technology (CCT), 2014 - present
- Provided program evaluation and assessment for technology-based education projects in Southern California.
- Collected data at elementary and middle schools (classroom observation and interviews), analyzed qualitative data, and reported findings to principal investigators and grant providers.

Postdoctoral Research Associate, UC Santa Barbara, Department of Computer Science and Department of Education

Understanding K-8 Teacher Learning and Knowledge for Computer Science, 2014 – 2015
- Investigated what elementary school teachers need to know and the learning processes they engage with to become computer science instructors.
- Developed research design and data instruments. Observed teachers in classrooms, interviewed high school and university computer science instructors, and analyzed data.
- Continued to manage education research for DEPICT (see below) and mentor multiple graduate students from both the computer science and education departments on the project.

Graduate Student Researcher, UC Santa Barbara, Department of Computer Science

Developing Elementary (Learning) Progressions to Integrate Computational Thinking (DEPICT), 2013 – 2014
- Collaborated with a university team on a multi-year, NSF funded project to investigate 4th graders' computational thinking and to design a corresponding curriculum for computer science (KELP-CS).
- Managed education research, data collection and analysis. Created and reviewed materials for curriculum, assessment, and teacher resources. Supported new grant development.

STEM Career Choice, 2013 – 2014
- Collaborated with faculty in communication and computer science to develop a project combining theories of motivation with theories of parental messaging as a means of explaining female persistence in science, technology, engineering, and mathematics (STEM).
- Developed online survey questions, managed IRB protocol, collected and analyzed relevant literature.

Co-founder & Principal Investigator, *PowerLines+, 2012 - 2014*
- Conceptualized, created, and executed a virtual peer network community for female academics (PowerLines+) with two colleagues.
- Organized and managed monthly video meetings and website content.
- Theorized and presented on the most effective methods for sustaining a virtual community.

Graduate Student Researcher, UC Santa Barbara, Department of Education

Teaching for Equity in Mathematics and Science Education, 2009 – 2014
- Collaborated on multiple research projects related to equity in mathematics education, teacher learning, and teacher professional development.
- Analyzed classroom video, transcribed data, coded transcripts, organized supporting documents and reviewed manuscripts for publication.

Science and Mathematics Initiative (SMI) / CalTeach, 2009 – 2012
- Organized supporting documents and research data related SMI and the Noyce Scholars Program at UC Santa Barbara with an interdisciplinary research team.
- Created and managed information database; directly corresponded with University of California Office of the President (UCOP) on data requests.
- Promoted in August 2011 for excellent service, work ethic, and reporting.

Publisher Relations Data Analyst, *Time Inc. (Synapse Group),* 2006 - 2008
- Supported the Publisher Relations department with unit analysis, title forecasting, and title list development.
- Created new information databases, projection and profit models, and presentation formats thereby developing extensive technical skills in data management, reporting, and modeling.
- Promoted in June 2007 for outstanding performance, accurate forecast models, and commitment to the departments goals.

TEACHING EXPERIENCE

Educational Technology Coordinator, Lower Campus (Grades 4 – 8), Ojai Valley School, 2015 - 2016

Technology & Computer Applications
- Created and delivered project-based, in-class technology/computing curricula to students in grades 4 -8. Topics included computer science, programming, robotics, 3D modeling/printing, website development, circuitry, and engineering design.

Lecturer, UC Santa Barbara, Department of Education

Qualitative Interviewing (ED 221B), 2015
- Instructed graduate students interested in the methods and methodology of interviewing for educational research.

Computer Science Teacher, Santa Barbara & Oxnard, CA

Kids Engaged in Learning Programing (KELP-CS), 2013 – 2015
- Delivered content and gauged student progress as part of an outreach program in local elementary schools where the majority of students identify as English Language Learners.

Instructor/Teaching Assistant, UC Santa Barbara, Department of Education

Advanced Problem Solving (MATH 181A, MATH 181B), 2014 [Teaching Assistant]
- Supported a mathematics faculty member over two academic quarters in teaching an upper-division, undergraduate course for mathematics majors interested in teaching secondary school mathematics.
- Implemented inquiry-based learning techniques and facilitated class discussions about how children represent, conceptualize and develop fundamental mathematical ideas.

Independent Study - Research Assistance (ED 199RA), 2012 – 2013 [Instructor]
- Taught introductory research methods in a small group setting with six undergraduates over three academic quarters on concepts related to educational research and qualitative methodology.

Seminar on Teaching and Learning (ED 253D), 2012 [Course Developer, Teaching Assistant]
- Proposed and developed a seminar on emerging topics in teaching and learning for first year graduate students while elected student leader (See Service).
- Oversaw implementation of course and consulted on curriculum after department approval, and collaborated on course execution with two faculty members in Fall 2012.

Introductory Statistics (ED 214A), 2010 [Teaching Assistant]

- Supported an Education faculty member in teaching a graduate level, introductory statistics course and quantitative research design.

Facilitator, UC Santa Barbara, Teacher Education Program, 2010 – 2012

Master's of Education (M.Ed.)
- Supervised and assisted 5 elementary school, pre-service teachers with their classroom-based research projects each academic year.
- Led group meetings, reviewed candidates' work, and mentored candidates as they collected, analyzed, and theoretically framed their research.

Teaching Assistant, Johns Hopkins University Center for Talented Youth, 2010 - 2011

Data and Chance
- Collaborated with a lead instructor to implement a middle school statistics/probability curriculum for gifted students (5th/6th graders). Taught in a classroom environment full time for multiple 3-week sessions.

Teaching Performance Assessment Scorer, UC Santa Barbara, Teacher Education Program, 2010 - 2011
Performance Assessment for California Teachers (PACT)
- Evaluated TPA portfolios for secondary-level mathematics pre-service teachers at UC Santa Barbara.
- Trained through a 3-day, subject-specific calibration and scored on a four-point rubric in planning, instruction, assessment, reflection, and academic language development.

SERVICE

K-12 Schools: Ojai Valley School

> **Student Advisor,** 6th Grade, 2015
>
> **Member,** STEM Education Committee, 2015

Professional Organizations

> **Proposal Reviewer,** American Education Research Association (AERA), 2013 - present
>
> **Session Presider**, National Association for Research in Science Teaching (NARST), 2014
>
> **Proceedings Reviewer,** Physics Education Research Conference (PERC), 2013
>
> **Member,** Diversity Taskforce, American Education Research Association (AERA) Special Interest Group (SIG) Research on Women in Education, 2012

University & Department: UC Santa Barbara

> **Mentor,** Students in the Gevirtz Graduate School of Education**, 2011 – 2015
>
> **Member**, Mathematics Education Faculty Search Committee, 2013 – 2014
>
> **Panelist,** Workshop for students in Gevirtz Graduate School of Education, 2012 - 2013
>
> **Mentor**, Student in the McNair Scholars Program, UC Santa Barbara, 2012
>
> **Vice President,** Internal Public Relations**, Graduate Student Association of Education, 2010 – 2011

- *2011 "Most Involved "Award for unselfishly devoting him/herself to the improvement of graduate student life at UCSB.*

Member, Education Faculty Search Committee, 2010

Representative, Graduate Student Association, 2009 – 2011

Community

Judge, Women in Computer Science (WiCS) International Women's Hackathon, Santa Barbara, CA, 2014

Member, Alliance for California Computing for Students and Schools (ACCESS), 2014

PROFESSIONAL AFFILIATIONS

American Educational Research Association (AERA)
     Division C Learning and Instruction
     Division J Postsecondary Education
     Special Interest Group (SIG) Research on Mathematics Education
     Special Interest Group (SIG) Technology as an Agent of Change in Teaching and Learning
     Special Interest Group (SIG) Technology, Instruction, Cognition, and Learning
National Association for Research in Science Teaching (NARST)
National Council of Teachers of Mathematics (NCTM)
ACM Special Interest Group on Computer Science Education (SIGCSE)