

Steven M. Weiner

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Research Statement

My research focuses on how innovative technologies, learning environments, and pedagogies influence the organizational culture and structure of educational institutions. I am particularly interested in how the Maker Movement and design-oriented practices might be catalysts for changing institutional norms within formal secondary education.

Education

- May 2021 (projected) ***PhD, Human and Social Dimensions of Science and Technology***
School for the Future of Innovation in Society
Arizona State University
Tempe, AZ
- May 2008 ***BA, Classical Studies***
College of Liberal Arts and Sciences
University of Florida
Gainesville, FL
Minors in Physics and Italian Studies

Research Experience

- August 2018 to Present **Independent Research**
Graduate Research Fellowship Program (NSF Solicitation #11-582)
National Science Foundation
- August 2016 to August 2018 **Graduate Research Associate**
Polytechnic School, Ira Fulton Schools of Engineering
Arizona State University
- Maker Educational Pathways (NSF Grant #1329321)
 - Co-PIs: Drs. Shawn Jordan and Micah Lande
 - Maker Learning Trajectories (NSF Grant #1723802)
 - PI: Dr. Micah Lande
 - DiALoG Argumentation Project (NSF Grants #1621496, #1621441)
 - PI: Dr. Bryan Henderson

Key research accomplishments:

- Gathered qualitative data from young Makers and their parents with critical incident and artifact elicitation interview protocols [J1, C5, C6]
- Analyzed qualitative data from in-practice STEM teachers utilizing thematic analysis and institutionally-oriented theoretical frameworks [J3]
- Led research studies on Maker identity using both existing and independently-gathered gathered data [J1, C5, C6]
- Supported Drs. Jordan and Lande in writing up on-going research [C3]
- Submitted proposal to NSF EAGER grant in response to DCL (Dec 2017)

- Mentored undergraduates in developing research questions, conducting studies, and writing individual conference papers [C4-C6, C8, C9, J2]
- Surveyed and synthesized current literature on Maker Education within the engineering education academic community [C7]

Journal Publications

- J3 **Weiner, S.**, Lande, M., & Jordan S. (In Submission) Designing (and) Making Teachers: Using Design to Investigate the Impact of Maker-based Education Training on Pre-service STEM Teachers. *International Journal of Engineering Education*.
- J2 Henderson, J., Zillmer, N., Holton, A., **Weiner, S.**, Greenwald, E., Goss, M., Lopez M., Morales, C., Pearson, P., & McNeill, L. (In Submission). How Science Teachers DiALOG Classrooms: Towards a Practical and Responsive Formative Assessment of Oral Argumentation. *Journal of Science Education and Technology*.
- J1 **Weiner, S.**, Jordan, S., & Lande, M. (2018, January 12). The Engineer of 2020, in the Making: Understanding how young adults develop Maker identities and the implications for education reform. *International Journal of Engineering Education*.

Conference Proceedings

- C9 **Weiner, S.**, Lande, M., & Jordan, S. (2019). Designing (and) Making Teachers: Using Design to Investigate the Impact of Maker-based Education Training on Pre-service STEM Teachers. In *Clive L. Dym Mudd Design Workshops*. Harvey Mudd College, Claremont, CA.
- C8 Horton, P., Jordan, S., Lande, M., & **Weiner, S.** (2018). Project-Based Learning Among Engineering Students During Short-Form Hackathon Events. In *Proceedings of the American Society for Engineering Education (ASEE) Annual Conference & Exposition*. Salt Lake City, UT.
- C7 **Weiner, S.**, Lande, M., & Jordan, S. (2018). What have we “learned” from Maker Education research?: A Learning Sciences-based review of ASEE literature on the Maker Movement. In *Proceedings of the American Society for Engineering Education (ASEE) Annual Conference & Exposition*. Salt Lake City, UT.
- C6 **Weiner, S.**, Lande, M., & Jordan, S. (2017). Making Identities: Understanding the factors that lead young adults to identify with the Maker Movement. In *Proceedings of the American Society for Engineering Education (ASEE) Annual Conference & Exposition*. Columbus, OH.
- C5 **Weiner, S.**, Lande, M., & Jordan, S. (2017). The Engineer of 2020, in the Making: Understanding how young adults develop Maker identities and the implications for education reform. In *Clive L. Dym Mudd Design Workshops*. Harvey Mudd College, Claremont, CA.
- C4 Lande, M., Jordan, S., & **Weiner, S.** (2017). Making people and projects: Implications for making-based learning. Presented at the ASEE Pacific Southwest Conference, Tempe, AZ.

- C3 La Place, C., Jordan, S., Lande, M., & **Weiner, S.** (2017). Engineering Students Rapidly Learning at Hackathon Events. In *Proceedings of the American Society for Engineering Education (ASEE) Annual Conference & Exposition*. Columbus, OH.
- C2 Larson, J., Lande, M., Jordan, S., & **Weiner, S.** (2017). Makers as Adaptive Experts-in-Training: How Maker Design Practices Could Lead to the Engineers of the Future. In *Proceedings of the American Society for Engineering Education (ASEE) Annual Conference & Exposition*. Columbus, OH.
- C1 Mabey, M. J., Jordan, S., Lande, M., & **Weiner, S.** (2017). A Comparison of Maker and Entrepreneurial Characteristics. In *Proceedings of the American Society for Engineering Education (ASEE) Annual Conference & Exposition*. Columbus, OH.

Awards, Fellowships, and Commendations

- September 2019 **Imaginary College Fellow**, a fellowship with Arizona State University's Center for Science and the Imagination that "celebrates the individuals and groups who are already advancing [their] mission of fresh, creative and ambitious thinking about the future".
- November 2018 **University Innovation Fellows**, a year-long fellowship for training and capacity-building in design thinking and organizational change within higher education. Granted through Stanford University's Hasso Plattner Institute of Design.
- April 2018 **HSD Personal Achievement Award**, in recognition of outstanding individual accomplishments during PhD studies. Awarded by Arizona State University's School for the Future of Innovation in Society.
- April 2018 **NSF GRFP Fellowship**, a nationally-competitive fellowship that provides funding and tuition for three years of graduate studies. Granted through the National Science Foundation's Graduate Research Fellowship Program.
- June 2017 **DEED Student Essay Contest**, *How engineering design education will be everywhere and nowhere in 2040*. Written for the Design in Engineering Education Division (DEED) of the American Society for Engineering Education (ASEE). Presented at the 2017 ASEE Annual Conference. Columbus, OH.
- November 2016 **Tormach Poster Award**, *CREATE-ing a welcoming space for Maker culture*. Poster presented at the 1st International Symposium on Academic Makerspaces (ISAM) 2016, Cambridge, Mass.

Posters, Panels, and Invited Talks

- March 2019 Weiner, S., Haymes, T., Pendse, R. (2019, March 14-15). *The Future of Assessment and Grading in Higher Education*. **Group facilitator** at the 2019 ShapingEDU Unconference, Tempe, AZ.
- May 2018 Lande, M., Jordan, S., **Weiner, S.** (2018, May 20). *Majoring in Making in College*. **Panel Discussion** (moderator) presented at the 2018 Maker Faire Bay Area, San Mateo, CA
- October 2017 **Weiner, S.** (2017, October). *The New Democratic Innovators: Young Makers and the Future of User-Centered Innovation*. **Poster** presented at the 2017 Society for the Study of New and Emerging Technology (S.NET) Meeting , Tempe, AZ

- August 2017 **Weiner, S.**, Ose, E., Leung, J., Smalley, J., Royal L. & Carroll, P. (2017, August). *Starting and Running a Makerspace*. **Panel Discussion** presented at the AZSciTech Festival Kick-off Conference, Mesa, AZ.
- March 2017 **Weiner, S.**, Diaz, C., Osowski, A., Morris, J., Hardina, S., & Pajak, A. (2017, March). *How to start your own Inquiry Based Learning Space*. **Panel Discussion** presented at the Southwest Maker Fest, Mesa, AZ.
- November 2016 **Weiner, S.** (2016, November). *CREATE-ing a welcoming space for Maker culture*. **Poster** presented at the 1st International Symposium on Academic Makerspaces (ISAM) 2016, Cambridge, Mass.
- October 2016 Lande, M., Jordan, S., & **Weiner, S.** (2016, October 2). Making research to educational practice. **Invited talk** at the 2016 World Maker Faire New York, Corona, NY.
- April 2015 **Weiner, S.** (2015, April 20) Making CREATE, a community-centered makerspace. **Invited talk** at the 2015 Phoenix Urban Design Week, Phoenix, AZ.

Service/Leadership

- December 2018 **Workshop Leader: Integrating Making, Design, and STEAM Education**
Arizona State University, Polytechnic Campus
Mesa, AZ
Conducted half-day of workshops for in-service K-8 teachers and administrators on how design and making activities can bridge the divide between STEM and Art
- August 2018 **Journal Reviewer**
Journal of Engineering Education
- April 2018 **Workshop Leader: Maker Education Pedagogy**
Mary Lou Fulton Teacher's College, Graduate Class: SCN 411
Tempe, AZ
Conducted hands-on introductory seminar for pre-service K-8 STEM teachers on the Maker Movement, focusing on how to infuse Making into their classrooms and curricula.
- October 2017 **Volunteer, FabLearn Conference**
Stanford University
Stanford, CA
Provided on-site organizational assistance during a 2-day conference on Maker Education hosted by Stanford University's School
- Fall 2017-
Fall 2018 **Mentor, Chief Science Officer Program**
Arizona Technology Council
Phoenix, AZ
Advised high school students and teachers from the Greater Phoenix Metro Area on ways to foster STEM cultures in their schools.

Educational Training/Pedagogy Courses

- July 2014 **Summer Teacher Institute**
Exploratorium
San Francisco, CA
Competitive summer program for middle and high school science teachers run by world-renowned scientists and educators at a top-tier interactive science center.
- June 2010 **Postgraduate Studies, Summer Physics Modeling Workshop**
Arizona State University
Tempe, AZ
Three-week course on teaching electromagnetism and circuits using an inquiry-based, lab-first pedagogy developed at Arizona State University.

Professional Experience

- July 2014 to August 2016 **Program Director**
CREATE at Arizona Science Center
Phoenix, AZ
- Contributed to the physical, programmatic, and organizational design of a 6,500 sq. ft. education-oriented, community makerspace
 - Developed relationships with local corporate, non-profit, and educational organizations to foster the growth of a Phoenix-based Maker community
 - Oversaw a staff of four full-time and four part-time employees, and an annual program budget of \$30,000
- Assisted in the creation and implementation of STE(A)M-based hands-on activities and technical workshops
- August 2009 to Dec 2014 **Science & Math Teacher**
Great Hearts Academies
Phoenix, AZ
- Taught Physics I, Physics II, Earth Science and Pre-calculus using inquiry-based and Socratic methodologies
 - Served as Curriculum Consultant for Physics I teachers in the Great Hearts Academies charter school network
 - Co-led a making-based STE(A)M club of over 50 students, ranging from rocketry to Rube Goldberg machines
- Established Physics departments for two separate academies; managed budgets and supply purchasing
- August to Dec 2007 **Staff Science Reporter**
The Independent Florida Alligator
Gainesville, FL
- Interviewed dozens of scientists, engineers, and school officials on latest University of Florida research
 - Wrote numerous feature-length articles on topics ranging from stem cell research to nano-scale engineering
 - Developed skills in communicating complex scientific ideas to a wide-ranging audience