

Justice Toshiba Walker

jtwalker@utep.edu | www.JusticeWalker.com | [@JusticeToshiba](https://www.instagram.com/JusticeToshiba)

Appointments

Assistant Professor, The University of Texas at El Paso

August 2020

STEM Education, Teacher Education, College of Education

Biology (by courtesy), Biological Sciences, College of Science

Education

Ph.D. University of Pennsylvania Graduate School of Education

August 2019

Thesis Title: *When Biology Learning Paradigms Shift: What Middle School Students Know, Think, and Learn about Synthetic Biology*

Dissertation Committee: Yasmin B. Kafai (chair), Iris Tabak, Sigal Ben-Porath

M.S. University of Pennsylvania School of Engineering and Applied Science

May 2012

Concentration: Biopharmaceutical & Engineering Biotechnologies

Advisor: Scott L. Diamond

B.S. University of Miami College of Arts and Sciences

May

2005

Concentration: Biology and English Literature

Thesis Title: *Non-Steroidal Anti-Inflammatory Drugs Elicit Apoptosis in Colon Cancer Cells via Caspase-dependent Pathways*

Advisor: Michael S. Gaines

Research Experience

University of Pennsylvania Graduate School of Education

NSF Grant #1623018: *bioMAKERlab: A Wetlab and Starter Activities for Promoting Synthetic Biology in High School Classes and Workshops.* Advised on the development of an open source low cost portable wet lab device and corresponding user interface. Co-developed: (1) three synthetic biology curriculum activities for middle and high school students, (2) website for curriculum dissemination, (3) research design to assess student inquiry practices, argumentation, knowledge building, perspectives, literacy, learning and wet lab device usability. Implemented all aspects of research design including qualitative and quantitative research instrument development, data collection, processing, and analysis, (4) institutional review board protocols and modifications needed to study more than 150 Philadelphia middle and high school students. Co-authored and presented peer reviewed journal and conference proceedings on research findings. Principal Investigator: Yasmin B. Kafai (University of Pennsylvania). Co-Principal Investigator: Orkan Telhan (University of Pennsylvania).

NSF Grant #1840933: *Workshop for Connecting Computational Thinking with Synthetic Biology Applications in K-16 Education.* Co-organized: (1) three *learn.design.bio* public workshops that convened a multinational group of computer scientists, biologists, learning scientists, educators, and early career scholars to discuss synthetic biology and engineering biology learning in K-16 formal and informal environments, (2) early career symposium and travel grant award call for submissions, application reviews, and award notifications, (3) workshop registration, logistics, and (4) workshop website with participant lists and workshop program. Principal Investigator: Yasmin B. Kafai (University of Pennsylvania). Co-Principal Investigators: Orkan Telhan (University of Pennsylvania) and Karen Hogan (University of Pennsylvania).

NSF Grant #1742124: *Collaborative Research: Debugging by Design: Developing a Tool Set for Debugging with Electronic Textiles to Promote Computational and Engineering Thinking in High School.* Co-developed: (1) research design to assess student computational thinking, debugging practices, perceived competence, and learning. Implemented all aspects of research design including qualitative and quantitative research instrument development, data collection, processing, and analysis, (2) institutional review board protocols and modifications needed to study more than 200 Los Angeles high school students. Co-authored and presented peer reviewed journal and conference proceedings on research findings. Principal Investigator: Yasmin B. Kafai (University of Pennsylvania).

NSF Grant #1509245: *Collaborative Research: ET-ECS: Electronic Textiles for Exploring Computer Science with High School Students & Teachers to Promote Computational Thinking and Participation.* Co-developed: (1) research design to examine electronic-textile based computer science learning assessments, student collaboration practices, student perceptions about computer science, and computational practices, (2) institutional review board protocols and modifications needed to study more than 400 high school students in Philadelphia and Los Angeles. Implemented all aspects of research design including qualitative and quantitative research instrument development, data collection, processing, and analysis. Co-authored and presented peer reviewed journal and conference proceedings on research findings. Principal Investigator: Yasmin B. Kafai (University of Pennsylvania).

University of Pennsylvania College of Arts and Sciences

2012-13

Graduate volunteer research on microRNA regulatory patterns in *Arabidopsis Thaliana*. Leveraged biotechnologies including, Agarose gel electrophoresis, Next Generation Sequencing, and National Center for Biotechnology Information (NCBI) database searches. Principal Investigator: Brian D. Gregory (University of Pennsylvania).

University of Miami College of Arts and Sciences

2002-05

Howard Hughes Medical Institute Grant # 52003758: Undergraduate research on the effects of non-steroidal anti-inflammatory (NSAID) compounds on a human cell line of colon cancer cells. Carried out eukaryotic tissue culture and microscopy (e.g., confocal fluorescence microscopy) and genetic screens (e.g., polyacrylamide agarose gel electrophoresis). Principal Investigator: Michael S. Gaines and James H. Wyche (University of Miami).

Journal Publications: In Preparation

Walker, J.T. What Middle School Students Say about Inquiry in BioDesign Learning.

Walker, J.T. A Case Study of Middle Schoolers' Use of Context to Explain and Justify their Attitudes about Synthetic Biology.

Journal Publications: Peer Reviewed

Walker, J. T. & Kafai, Y. B (under review). The Biodesign Studio: Constructions and Reflections of High School Students on Making with Living Media. *British Journal of Educational Technology*.

Walker, J. T. (revise and resubmit). Middle School Student Knowledge and Attitudes Toward Biotechnology. *Journal of Science Education and Technology*.

Kafai, Y. B., & **Walker, J. T.** (2020). Bringing 21st-century science into schools. *Phi Delta Kappan*, 102(1), 38-41.

Lui, D., Kafai, Y.B., Litts, B., **Walker, J.T.**, Widman, S. (2019). Pair Physical Computing: High School Students' Practices and Perceptions of Collaborative Coding and Crafting with Electronic Textiles. *Computer Science Education*.

Lui, D., **Walker, J.T.**, Hanna, S., Kafai, Y.B., Fields, D., & Jayathirtha, G. (2019). Communicating computational concepts and practices within high school students' portfolios of making electronic textiles. *Interactive Learning Environments*, 1-18. <https://doi.org/10.1080/10494820.2019.1612446>.

Litts, B.K., Widman, S.A., Lui, D. A., **Walker, J.T.**, & Kafai, Y.B. (2019). A Maker Studio Model for High School Classrooms: The Nature and Role of Critique in an Electronic Textiles Design Project. *Teachers College Record*, 121(9).

Walker, J.T. (2018). Review of Our School: Searching for Community in an Era of Choice, By Sam Chaltain. *The Journal of Negro Education*, 87(4), 460-462. <https://doi.org/10.7709/jnegroeducation.87.4.0460>.

Litts, B.K., Kafai, Y.B., Lui, D., **Walker, J.T.**, & Widman, S.A. (2017). Stitching Codeable Circuits: High School Students' Learning about Circuitry and Coding with Electronic Textiles. *Journal of Science Education and Technology*, 26(5), 494-507. <https://doi.org/10.1007/s10956-017-9694-0>.

Conference Proceedings: Peer Reviewed

Walker, J.T. and Kafai, Y.B. (2020, October). Making with Living Media: High School Youth Participation and Projects in the Biodesign Challenge. FabLearn 2020.

Kafai, Y.B. and **Walker, J.T.** (2020, October). Tools for Biomakers: Reviewing Affordances and Constraints for K-12 Hands-On Making with Biology. FabLearn 2020.

Kafai, Y.B. and **Walker, J.T.** (2020, May). Twenty Things to Make with Biology. In *Tangney, B., Byrne, J., & Girvan, C. (Eds.). Proceedings of the 2020 Constructionism Conference*, 551-559. Dublin, Ireland. <http://www.constructionismconf.org/>.

Walker, J.T., Slater, S., & Kafai, Y. (2019, June). A Scaled Analysis of How Minecraft Gamers Leverage YouTube Comment Boxes to Participate and Collaborate. In *Lund, K., Niccolai, G. P., Lavoué, E., Gweon, C. H., & Baker, M. (Eds.), A Wide Lens: Combining Embodied, Enactive, Extended, and Embedded Learning in Collaborative Settings, 13th International Conference on Computer Supported Collaborative Learning (CSCL)*, 1, 440-447. Lyon, France: International Society of the Learning Sciences. <https://repository.isls.org/handle/1/1601>.

Shaw, M., **Walker, J.T.**, & Kafai, Y. (2019, June). Arguing about Synthetic Biology in 140 Characters or Less: Affordances of Microblogging for High School Students Discussions of Socioscientific Issues. In *Lund, K., Niccolai, G. P., Lavoué, E., Gweon, C. H., & Baker, M. (Eds.), A Wide Lens: Combining Embodied, Enactive, Extended, and Embedded Learning in Collaborative Settings, 13th International Conference on Computer Supported Collaborative Learning (CSCL)*, 1, 526-533. Lyon, France: International Society of the Learning Sciences. <https://repository.isls.org/handle/1/1613>.

Lui, D., Kafai, Y.B., **Walker, J.T.**, Hanna, S., Hogan, K., & Telhan, O. (2019, March). A Reevaluation of How We Think about Making: Examining Assembly Practices and Artifact Imagination in Biomaking. In *Proceedings of FabLearn*, 34-41. ACM. <https://doi.org/10.1145/3311890.3311895>.

Kafai, Y.B., Fields, D.A., Lui, D.A., **Walker, J.T.**, Shaw, M. S., Jayathirtha, G., & Giang, M.T. (2019, February). Stitching the Loop with Electronic Textiles: Promoting Equity in High School Students' Competencies and Perceptions of Computer Science. In *Proceedings of the 50th ACM Technical Symposium on Computer Science Education*, 1176-1182. ACM. <https://doi.org/10.1145/3287324.3287426>.

Walker, J.T., Shaw, M., Kafai, Y., & Lui, D. (2018, June). Biohacking Food: A Case Study of Science Inquiry and Design Reflections about a Synthetic Biology High School Workshop. In *Kay, J. and Luckin, R. (Eds.) Rethinking*

Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS), 3, 1559-1560. London, UK: International Society of the Learning Sciences.

<https://repository.isls.org/handle/1/733>.

Kafai, Y., Horn, M., Danish, J., Humburg, M., Tu, X., Davis, B., Georgen, C., Enyedy, N., Blikstein, P., Clegg, T., Byrne, V.L., Norooz, L., Kang, S., Froehlich, J., **Walker, J.T.**, Lui, D., Anderson, E., Kafai, Y., Bumbacher, E., Washington, P., & Riedel-Kruse, I. (2018, June). Affordances of Digital, Textile and Living Media for Designing and Learning Biology in K-12 Education. In *Kay, J. and Luckin, R. (Eds.) Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS)*, 2, 1275-1282. London, UK: International Society of the Learning Sciences. <https://repository.isls.org/handle/1/604>.

Anderson, E., **Walker, J.T.**, Kafai, Y.B., & Lui, D. (2017, August). The gender and race of pixels: an exploration of intersectional identity representation and construction within minecraft and its community. In *Proceedings of the 12th International Conference on the Foundations of Digital Games*. ACM.

<https://doi.org/10.1145/3102071.3102094>.

Litts, B.K., Lui, D.A., Widman, S.A., **Walker, J.T.**, & Kafai, Y.B. (2017, June). Reflections on Pair E-Crafting: High School Students' Approaches to Collaboration in Electronic Textiles Projects In *Smith, B. K., Borge, M., Mercier, E., and Lim, K. Y. (Eds.). (2017). Making a Difference: Prioritizing Equity and Access in CSCL, 12th International Conference on Computer Supported Collaborative Learning (CSCL)*, 2, 569-572. Philadelphia, PA: International Society of the Learning Sciences. <https://repository.isls.org/handle/1/286>.

Kafai, Y., Telhan, O., Hogan, K., Lui, D., Anderson, E., **Walker, J.T.**, & Hanna, S. (2017, June). Growing designs with biomakerlab in high school classrooms. In *Proceedings of the 2017 Conference on Interaction Design and Children*, 503-508. ACM. <https://doi.org/10.1145/3078072.3084316>.

Litts, B.K., Kafai, Y.B., Lui, D., **Walker, J.T.**, & Widman, S. (2017, March) Understanding High School Students' Reading, Remixing, and Writing Codeable Circuits for Electronic Textiles. In *Proceedings of the 2017 ACM SIGCSE Technical Symposium on Computer Science Education*, 381-386. ACM.

<https://doi.org/10.1145/3017680.3017740>.

Lui, D., Litts, B.K., Widman, S., **Walker, J.T.**, & Kafai, Y.B. (2016, October). Collaborative Maker Activities in the Classroom: Case Studies of High School Student Pairs' Interactions in Designing Electronic Textiles. In *Proceedings of the 6th Annual Conference on Creativity and Fabrication in Education*, 74-77. ACM.

<https://doi.org/10.1145/3003397.3003408>.

Conference Presentations: Peer Reviewed

Walker, J.T. and Strawhacker (under review). The Biomaker Ecosystem: Technologies, Spaces and Curriculum for K-12 Making with Biology. American Educational Research Association Annual Meeting, Orlando, FL.

Fields, D. A., Kafai, Y. B., Lui, D., Shaw, M., Jayathirtha, G. & **Walker, J. T.** (2020, April) *Supporting Computer Science Engagement and Learning Through Reflective, Process-Based Portfolio Assessments* [Structured Poster Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/y3kvjcfh> (Conference Canceled).

Walker, J.T., & Kafai, Y.B. (2019, April). Designing Life in the 21st Century: A Review of High School Students' Attitudes Toward Biotechnologies. Poster presentation at the American Education Research Association Annual Meeting, Toronto, CA.

Walker, J.T., Fields, D.A., Kafai, Y.B. Nakajima, T.M., Lui, D., Goode, J., Margolis, J.S., Jayathirtha, G., & Shaw, M. (2019, April). Scaling up Equity with E-Textiles: Stitch the Loop Unit Results in Exploring Computer Science. Poster presentation at the American Education Research Association Annual Meeting, Toronto, CA.

Fields, D.A., Kafai, Y.B., Shaw, M., Lui, D., Nakajima, T.M., Goode, J., Margolis, J.S., Jayathirtha, G., & **Walker, J.T.** (2019, April). Stitching the Loop: An E-Textiles Curriculum for Exploring Computer Science. Poster presentation at the American Education Research Association Annual Meeting, Toronto, CA.

Walker, J.T., Shaw, M.S., & Kafai, Y.B. (2019, March). bioCAKES: Making with Biology. Workshop Presented at Annual *Fablearn Conference*, New York, NY.

Lui, D., **Walker, J.T.**, Jayathirthi, G., & Kafai, Y.B. (2018, April). Maker Process Portfolios: Looking at How Students Document Interdisciplinary E-Textiles Projects Within Digital Portfolios. Poster presented at the American Education Research Association Annual Meeting, New York, NY.

Anderson, E., Lui, D., **Walker, J.T.**, & Kafai, Y.B. (2018, April). What is a Maker Mindset? Exploring 'Thinking Outside the Box' through E-Textiles and BioDesign Making. Poster presented at the American Education Research Association Annual Meeting, New York, NY.

Lui, D., **Walker, J.T.**, Hanna, S., Hogan, K., Kafai, Y.B., & Telhan, O. (2017, October). Making with Biology: How to Grow Socially Responsive and Creative Designs with bioMAKERlab. *Digital Media & Learning*. Irvine, CA.

Litts, B.K., Lui, D., **Walker, J.T.**, Widman, S., & Kafai, Y.B. (2017, April) Computational Circuitry: High School Student Code Circuits in Electronic Textile Designs. Poster presented at the American Education Research Association Annual Meeting, San Antonio, TX.

Litts, B.K., Lui, D., Widman, S., **Walker, J.T.**, & Kafai, Y.B. (2017, April) Science Lab as Maker Studio: Creating and Critiquing Electronic Textiles in a High School Class. Roundtable presented at the American Education Research Association Annual Meeting, San Antonio, TX.

Litts, B.K., Kafai, Y.B., Lui, D., Widman, S., & **Walker, J.T.** (2017, April) Collaborative E- Crafting: Adopting Collectivistic Orientations Toward E-Textiles Maker Projects. Poster presented at the American Education Research Association Annual Meeting, San Antonio, TX.

Book Chapters

Fields, D., Kafai, Y., Aguilera, E., Slater, S., & **Walker, J.T.** (accepted) Perspectives on Scales, Contexts and Directionality of Collaborations in and around Virtual Worlds and Video Games. In *International Handbook of Computer Supported Collaborative Learning*.

Conference Presentations: Non Peer Reviewed

Walker, J.T. & Kafai, Y.B. (2018, October). Synthetic Biology Activities for K-12 Students. '18 Global Community Biosummit. Massachusetts Institute of Technology, Cambridge, MA.

Kafai, Y.B., **Walker, J.T.**, Lui, D., Hogan, K., & Telhan, O. (2017, September). Kids as Biodesigners. '17 Global Community Biosummit. Massachusetts Institute of Technology, Cambridge, MA.

Anderson, E. & **Walker, J.T.** (2017, April) Diversifying Barbie and Mortal Kombat: Where Are We Now, Massachusetts Institute of Technology, Cambridge, MA.

Walker, J.T. (2005, May) Non-Steroidal Anti-Inflammatory Drugs Elicit Apoptosis in Colon Cancer Cells via Caspase-dependent Pathways. Poster presented at the Atlantic Coast Meeting of the Minds Conference, Coral Gables, FL.

Walker, J.T. (2004, July) Antiproliferative Effects of Natriuretic Peptides on Smooth Muscle Epithelial Cell hypertrophy. Leadership Alliance National Symposium, Chantilly, VA.

Teaching Experience

The University of Texas at El Paso (El Paso, TX)

Undergraduate Level Teaching Science in Secondary School 2019-current

LaSalle University Department of Biology (Philadelphia, PA)

Undergraduate Level Cellular Biology and Genetics Laboratory
2019-current

University of Pennsylvania Graduate School of Education (Philadelphia, PA)

Graduate Level Science Education Methods, Instructor
summer 2020

Graduate Level Maker Studio, Co-Instructor

Spring 2020

Graduate Level Learning Sciences: Past, Present, and Future, Co-Instructor

Spring 2020

Graduate Level Video Games and Virtual Worlds, Co-Instructor

Spring 2020

Graduate Level Science Education Methods, Instructor

summer 2019

Graduate Level Video Games and Virtual Worlds, Guest Lecturer

November

2018

University of Pennsylvania, College of Arts and Sciences (Philadelphia, PA)

Undergraduate Level Introduction to Biology Teaching Assistant

spring

2012 Graduate Level Advanced Biochemistry Teaching Assistant

spring 2011;

fall 2012

Johns Hopkins University Center for Talented Youth (CTY)

2013-16

High School Biology Summer Instructor (Johns Hopkins University, Baltimore, MD)

High School Health Science Summer Instructor (King Saud University, Riyadh, Saudi Arabia)

High School Biotechnology Summer Instructor (Haverford College, Lancaster, PA)

High School Biotechnology Summer Instructor (Roger Williams University, Bristol, RI)

Islamic Saudi Academy (Alexandria, VA)

2012-15

High School Biology and Biotechnology Instructor

Friendship Public Charter School (Washington, DC)

2008-12

High School Advanced Placement Biology and Microbiology Instructor

Palm Beach County Public Schools (West Palm Beach, FL)

2007-08

High School Reading Instructor

Orange County Public Schools (Orlando, FL)

2006-07

Middle School Physical Science Instructor

Awards

National Science Foundation sponsored Doctoral Consortium Fellowship award \$1,500

summer

2018

National Science Foundation Internship Grant #1623018 supplemental funding award \$50,000 2018	fall
National Science Foundation Graduate Research Fellowship Program Honorable Mention 2017	
GSE Student Government President's Community Leadership Award	2017
Howard Hughes Medical Institute Scholarship Grant # 52003758 award \$160,000 2001-05	

Journal Reviewer Activities

The Journal of Negro Education	2016-current
Interactive Learning Environments	2018-current
International Journal of Child-Computer Interaction	2019-current

Conference Reviewer Activities

The American Education Research Association 2016-current SIG-Advanced Technologies for Learning SIG-Learning Sciences SIG-Science Teaching and Learning Division C: Learning and Instruction	
FabLearn Conference	2018-current

Professional Service

University of Pennsylvania Fontaine Society Fellowship 2015-current Coordinating Committee Treasurer	
Massachusetts Institute of Technology Global Community Bio Summit Conference Co-chair Organizing Committee: Co-organized inaugural fellows program application, selection, and leadership training. Co-organized event <i>Learning and Education</i> tracks including panels, lightning talks, and breakout sessions. Co-organized event applications and program committee.	2018-current
SynBioBeta Conference 2018 Media Committee Volunteer	fall
University of Pennsylvania Graduate School of Education Commencement Marshall 2018 Committee on Degrees Student Representative 2016-17 Faculty Promotions Committee Student Representative fall 2017 Awards Committee Student Representative 2016	spring 2017; spring
International Society of the Learning Sciences Computer Supported Collaborative Learning Conference Student Volunteer	2016

Professional Memberships

International Society of the Learning Sciences	2016-current
American Educational Research Association Division C: Learning and Instruction Division K: Teacher and Teacher Education	2015-current

Learning Sciences

Multicultural/Multiethnic Education: Theory, Research and Practice, Awards Committee Co-Chair

Science Teaching and Learning

National Science Teachers Association

2015-current

National Association for the Advancement of Colored People

2015-current

Smithsonian Institute

2014-current

National Museum of African American History and Culture Ambassador

DC Canes University of Miami Alumni Club

2013-16

Mid-Atlantic International Baccalaureate Association of World Schools

2014-15

Board Member At-Large

Alpha Phi Alpha Fraternity, Inc.

2002-present