

Curriculum Vitae: Christopher S. Brownell (PhD.)

Education:

Doctor of Philosophy of Education (Mathematics, Policy and Practice)
Claremont Graduate University (December, 2015) (GPA 3.9)
Title: “An Investigation into the Implementation of the Common Core State Standards in Mathematics: Teacher Concerns and Understandings of Transformation Geometry”
Claremont, CA. Areas of Concentrated Study: GIS Analysis, Social Network Analysis, Hierarchical Linear Models applied to Educational Settings, Probability Theory, Mathematical Knowledge for Teaching, and Educational Policy.

Master of Arts in Mathematics Education (Secondary Emphasis)
Fresno Pacific University (May, 1999)
Fresno, CA

Bachelor of Arts in Mathematics (Teaching Emphasis)
California State University Fresno (December, 1985)
Fresno, CA

Professorial, Teaching, Administration, and Research Experience:

Present and most recent positions:

Chairperson of Mathematics & Science Programs (Undergraduate) Pratt Institute, Brooklyn, NY USA. (July 2023 thru Present)

Head of Instruction, The National Museum of Mathematics (MoMath), NYC, NY, USA (November 2022 thru June 2023).

Visiting Researcher/Professor, University of Jyväskylä Finland, assigned to the Finnish Institute of Educational Research (Innovative Learning Environments Section), STEAM Education Initiative (September & October 2022).

Program Director & Associate Professor of Mathematics & STEM Education, School of Education, Fresno Pacific University; Fresno CA. (2014 -2022), program developer, supervised a team of full-time tenure track and part time adjunct faculty, taught graduate courses in math education and undergraduate courses in math & statistics.

Co-Curator, *The John A. Hiigli Children and Youth Math Art Exhibit*. This is an annual, rotating, exhibit funded by the painter, educator and founder of the Jardin Children’s Art Galerie of New York. This collection is maintained as part of the growing collection of artworks in the Bridges Math Art collection. (2019-).

Co-Online Moderator: Special Seminars (Monthly) of the IOSTE (S. Korea) “International Organization of STEAM Education” (January through April, 2022).

Past Positions:

August 2014 to August 2016: Fresno Pacific University Assistant Professor of Mathematics & STEM Education, Program Director Mathematics and STEM Education. Co-appointment as The Coordinator of Outreach, The AIMS Center for Mathematics & Science Education Research (August 2014) thru June 2018.

July 2014 to June 2018: AIMS Center for Math & Science Education; Fresno CA. Coordinator of Outreach: focused on Center/FPU relations, Supervision of IRB preparation, Colloquium Series coordination, ZPC: The Zone of Potential Construction Podcast Host and Originator. Partnership with various Math & Science Education organizations throughout the region.

February 2011 to July 2014: Claremont Graduate University; Claremont CA. Grant Coordinator (Teachers Employing Applied Mathematics to Engage Students TEAMES) and Faculty Advisor (Teacher Education Internship Program TEIP).

October 2010 to June 2011: Fresno Pacific University; Fresno CA. Title V: Paseo, STEM Cohort Grant Coordinator and Assistant Professor of Mathematics

August 2000 to October 2010: Fresno Pacific University; Fresno CA. Faculty in Mathematics/Department Chairman Undergraduate Mathematics Department of the School of Natural Sciences.

1987 – 1999: Central Unified School District; Fresno CA: Central High School (West then East Campuses): Department Chairman and Teacher of Mathematics.

1985 – 1999: Fresno City College; Fresno CA: Adjunct Faculty in Mathematics.

Courses Taught Since Hire Date 2000

Traditional Undergraduate School of Natural Sciences: Calculus 1 & 2, Principles of Mathematics, Introduction to Statistics*
Principles of Geometry, Abstract Algebra, Number Theory, Problem Solving, History of Mathematics, Real Analysis, Discrete Mathematics, Special Topics in Numeration Theory

Degree Completion School of Natural Sciences: Discrete Structures (CIS program)

Graduate Mathematics Education Program School of Education: Problem Solving, Advanced Geometry, Advanced Algebra, Probability & Statistics, History of Mathematics, Discrete Mathematics, Topics: Mathematical Modeling in the K12 Classroom, Topics: The Role of Change of Perspective in Mathematics, Core Mathematics I, II, III, IV (taught or co-taught)

* Calculus I, Principles of Mathematics, and Introduction to Statistics are among the TUG General Education offerings.

University Service

Programmatic Work:

Over the 22 years I have been employed at Fresno Pacific University I have occasion to update, revise, redesign, and create several programs. These include in chronological order working backwards: re-design of Master of Arts in Mathematics Education (Secondary Emphasis) (launched in Spring 2021), creation of Supplemental Authorization in Middle School Mathematics (launched in Fall 2020), revision of Master of Arts in Education (Elementary Emphasis), creation of Master of Arts in STEM (Science, Technology, Engineering, and Mathematics) Education (K-8 emphasis) (launched 2015), update and revise Mathematics (TUG) 2003, and 2007.

Grant/Administrative Work Since 2006:

Beginning 2024, Overseas Director for the International Society for the Advancement of STEAM (ISAS). This is an organization committed to advancing the practice(s) embedded in STEAM and Convergence Education. It is based in Seoul, South Korea at the Korea National University of Education.

2023 – Present, Co-PI Hydrogels Product Research and Development; NSF Accelerator Grant, Award ID 2236235. Pratt Institute, Brooklyn NY.

2016 – Present, Editorial Board of The Journal of Mathematics and the Arts, Taylor-Francis publishers.

2015-2017: Principal Investigator; California Math-Science Partnership (MSP); Fresno Pacific University/Kings County Office of Education.

2014 - 2022: Program Director; Mathematics & STEM Education programs, Fresno Pacific University; Fresno CA.

2011 through 2014 Grant Coordinator Teachers Employing Applied Mathematics to Engage Students (TEAMES) (US Dept. of Education (US ED), Teaching for a Competitive Tomorrow), Claremont Graduate University; Claremont CA.

2010 through June 2011 Grant Coordinator Paseo-STEM Cohort (US ED Title V) program, Fresno Pacific University; Fresno CA.

2006 through 2011 Department Chair Undergraduate Mathematics department, Fresno Pacific University; Fresno CA.

Service to the Community

I am involved in many local, statewide, national and international committees related to Math, STEM, and STEAM Education along with organizations and publications related to Mathematics and the Arts. Here are a few:

Steering Committee for the California STEAM Symposium (Proposal Reviews and Organization) Since 2017
Bridges Math & Art Community (Program & Proceedings Committee including article reviews, Family Math Day co-Coordinator 2018, 2019, 2021, 2022)
Eurasian Review of Mathematics Education (Reviewer)
Journal of Mathematics and the Arts (Reviewer)
Open Education Studies (Reviewer)
The Mathematical Intelligencer (Reviewer)
Lead Ambassador for the Global Math Project (<https://globalmathproject.org>)
Fresno and Madera Math Educators (FaMME) an affiliate to the statewide organization, California Math Council.

Publications and Presentations

Pekonen, O., Fenyvesi, K., **Brownell, C.**, Rumpunen, M. (2022). *I am my research and the whole world is my stage, The Lumieres festival in Finland: a harmonious blend of music, art, science and subversive ideas*. Brill-Sense (2022).

Lavicza, Z., Prodromou, T., Weinhandl, R., Lieban, D., Hohenwarter, M., Fenyvesi, K., **Brownell, C.**, Diego-Montecón, J.M.: *Developing and Evaluating Educational Innovations for STEAM Education in Rapidly Changing Digital Technology Environments*. Journal of Educational Change (1-2022).

Brownell, C. *Can University Admissions Requirements in Math Change the World?* March 17, 2021. Invited talk to the “ISEP Seminars on Novel Teaching Technologies,” University of Porto, Porto Portugal. https://www.isep.ipp.pt/Page/ViewPage/ISEP_Semin_Prog

Fenyvesi, K., **Brownell, C.**, Sinnemäki, J., Lavicza, Z. (2021). *Activating Creativities by Emphasizing Health and Well-Being: A holistic pedagogical practice from Finland*. Chapter in ‘Sculpting New Creativities in Primary Education’ edited by: Burnard, P., Loughrey, M. in the “Unlocking Research Series,” Brill Publishing. (2021).

Burnard, P., Sinha, P., Fenyvesi, K., **Brownell, C.**, Lavisza, Z., Steyn, C., Werner, O. (2020). Reconfiguring STEAM through material enactments of mathematics and arts: A diffractive reading of young people’s interdisciplinary math-artworks. Chapter in: Why science and arts creativities matter: Reconfiguring STEAM for future-making education. Brill Publishing, (2020). DOI:[10.1163/9789004421585_012](https://doi.org/10.1163/9789004421585_012)

Capozucca, A., Fenyvesi, K., Stettner, E., Miyazaki, K., Maehata, N., **Brownell, C.**, Kaukolinna, M., Pekonen, O., & Lavicza, Z. (2020). Exploring spherical symmetries through hands-on and digital modeling: Temari in the classroom! *International Conference on the Advancement of STEAM - ICAS*. https://issuu.com/alobatnic/docs/icas_2020_proceedings

Fenyvesi, K., Lehto, S., **Brownell, C.**, Nasiakou, L., Lavicza, Z., Kosola, R. (2020). *Learning mathematical concepts as a whole body experience*. Chapter in: Why science and arts creativities matter: Reconfiguring STEAM for future-making education. Brill Publishing, (2020). Doi:[10.1163/9789004421585_018](https://doi.org/10.1163/9789004421585_018).

Fenyvesi, K., **Brownell, C.**, Salmi, H., Park, H.G., Muntean, A., Kaukolinna, M., Thuneberg, H., Bogner, F., Lavicza, Z., (2019). *Environmental problem-solving and hands-on geometry learning through storytelling inside a geodesic dome: Ice, honey, and stardust*. A workshop paper presented and published in the Proceedings of Bridges Math Art Conference 2019, Linz Austria.

Fenyvesi, Kristóf, **Brownell, C.**, Burnard, P., Sinha, P., Olivier, W., Steyn, C., & Lavicza, Z. (2019). Mathematics and Art Connections Expressed in Artworks by South African Students. In *On Art and Science* (pp. 291–312). Springer. DOI: 10.1007/978-3-030-27577-8_19

Brownell, C. (2019). Weird Math: A Teenage Genius & His Teacher Reveal the Strange Connections Between Math & Everyday Life (Book Review) in *The Mathematical Intelligencer*; Springer Science + Business Media LLC. Doi:10.1007/s00283-019-09889-5. ISSN: 0343-6993

Brownell, C. Singh, S. (2019). *Math Recess Playful Learning in an Age of Disruption*. Book, pp. 241, ISBN: 978-1-948334-16-7 Published by the IMpress inc., Ontario Canada.

Fenyvesi, Kristóf, **Brownell, C. S.**, Salmi, H., Park, H. G., Muntean, A., Kaukolinna, M., Thuneberg, H., Bogner, F., & Lavicza, Z. (2019). Environmental Problem-solving and Hands-on Geometry Learning through Storytelling inside a Geodesic Dome: Ice, Honey and Stardust. *Bridges 2019 Conference Proceedings*, 635–642.
<https://archive.bridgesmathart.org/2019/index.htm>

Brownell, C. (November, 2018) “Real Data = Real Math: Incorporating Physical Phenomena in the Secondary Math Classroom” talk given at California Mathematics Council Southern Conference. Palm Springs CA 11-2-2018.

Brownell, C. (June, 2018) “A Physics Lab in Your Pocket?! The PocketLab opens the door to integrating physical phenomena into the mathematics classroom.” Delivered in Parallel Session 2 on Thursday June 28, 2018 published in the Proceedings of the 7th Congress on Digital Tools in Mathematics (CADGME) in Coimbra, Portugal. <https://www.uc.pt/en/congressos/cadgme2018>

Brownell, C. (December 2017) Interpreting Physical Phenomena via The PocketLab” A presentation to the California STEAM Symposium; San Fransisco, CA.

Brownell, C. (October 2017) “Exploding Dots, The Global Math Project: A Report and Review. Presented to the California Math Council Southern Conference; Palm Springs CA

Brownell, C. (October, 2017 & December 2017 North) Paper Folding Geometry a Start on Calculus Concepts Presented to the California Math Council Southern Conference; Palm Springs CA and Northern Section in Asilomar CA.

Stone, L., **Brownell, C.** (July, 2017) “Versatile Genius: A Case Study Intersecting Math, Science, Art, and California’s National Parks.” Proceedings of Bridges Math-Art, Waterloo 2017 Conference. pp. 221-228.

Brownell, C. (27-April-2017) “A Brief History & Status Update on Mathematics Curricula in the USA” Invited talk, Jyväskylä University Conference on Mathematics Curriculum Innovation and Research. Jyväskylä, Finland.

Brownell, C. (20-April-2017) “On HexaFlexagons and the Binary Representation of Integers” a presentation to Finnish teachers at the “Experience Workshop” Kuopio, Finland.

Brownell, C. (4-December-2016) “Understanding a Deep Principle of Number via Doubling” paper and presentation delivered at California Mathematics Council-North. Asilomar, CA

Brownell, C. (3-November-2016) “Understanding a Deep Principle of Number via Doubling” paper and presentation delivered at California Mathematics Council-South conference. Palm Springs, CA

Brownell, C. (2014-2018 *approximately 150 episodes*) “The Zone of Potential Construction” a weekly podcast of the AIMS Center for Mathematics & Science Education Research. Access @ www.aimsedu.org/zpc/

Brownell, C., Blanks, D., Friesen, T., Hoff, L., McAleenan, A., Merritt, S., Perry, R. (13-November-2016). “Fresno Pacific University visits Finland & Estonia” a presentation to the faculty in Faculty Seminar at FPU. Reporting upon a research tour of educational systems in Finland and Estonia in May 2016.

Brownell, C. Pauls, S. (10-October, 2016) “The Physics of Falling Objects: An Opportunity for Cross-Curricular Integration” a workshop presented at the California STEM Symposium, Anaheim, CA.

Brownell, C. Pauls, S. (24-October, 2016) “Graphical Analysis: Where Science & Mathematics Meet” paper & workshop presented California Science Teachers Association, Palm Springs, CA.

Brownell, C. (12-September, 2016). “Mathematical Modeling in the K-12 Classroom: How to Assess and Encourage Creativity” A paper and presentation given at the AIMS Center Colloquium Series 2016-2017.

Brownell, C. (29-July-2016) “Using Mystery to Enhance Joy of Learning” A TED-Talk delivered to the “Better Together: National Teachers Summit” held at Fresno Pacific University; Fresno, CA.

Brownell, C. Pauls, S. (25-July thru 29 July 2016) “The Integration of Life, and Earth Sciences and Mathematics to the teaching of California Eco-systems” a week-long presentation of content, pedagogy, and philosophy of learning in conjunction with the California Math-Science Partnership in Kings County California. (Co-PI’s and presenters)

Brownell, C. (24-February-2016) “Teacher Understandings of Transformation Geometry” A Seminar delivered to the Faculty @ Fresno Pacific University.

Brownell, C., Pauls, S. (29-October-2015) “Graphical Analysis: Linking the Mathematical and Scientific to Engage Students” a presentation @ California STEM Symposium; Anaheim CA.

Brownell, C. & Pauls, S. (2015). *Art, math, and physics: All about FOR*. The STEAM Journal vol. 2 issue 1. Published online @ <http://scholarship.claremont.edu/steam/vol2/iss1/29/>

Brownell, C. (December 2013) “Where do you find good problems to model in class: You don’t, make them yourself!” presentation @ California Math Council, Asilomar CA.

Brownell, C. & Foster, I. (November 2013) “Mathematical Models in the 7-12 Classroom” presentation @ California Math Council, Palm Springs, CA.

Brownell, C. & Foster, I. (October 2013) “TEAMERS: Engagement via Applied Mathematics” paper presentation to National Council Teachers of Mathematics Regional Conference, Las Vegas NV.

Brownell, C. (2013). *Equations of light: The STEAM journal inaugural issue, cover art*. The Steam Journal v. 1 issue 1. Published online @ <http://scholarship.claremont.edu/steam/vol1/iss1/>

Brownell, C. (2013). “A Short story about long lines: From Euclid to Hyperbole” invited speech for the launch event for the “Inaugural Edition of the STEAM Journal” delivered 28-March-2013 at The Claremont Graduate University; Claremont CA.

Presentations and papers prior to 2013, available upon request, include work with or for the following: Education Testing Service Pre-AP, College Preparatory Mathematics (CPM) Professional Development Team, San Joaquin Valley Mathematics Project, Fresno, Madera, Tulare, Inyo, San Joaquin, and Sacramento Counties, California Mathematics Council, San Gabriel Valley Mathematics Council, San Bernardino City Unified School District, California State Department of Education, Utah State University, Pomona College, and the Claremont Graduate University.

Professional Organizations and Affiliations:

Steering Committee for the California STEAM Symposium (Proposal Reviews and Organization) 2017

Bridges Math & Art Community (Steering Committee including article reviews, Family Math Day co-Coordinator 2018-2022)

Journal of Mathematics and the Arts (Reviewer)

Open Education Studies (Reviewer)

The Mathematical Intelligencer (Reviewer)

American Statistics Association (ASA)

American Education Research Association

Californian Mathematics Council

California Science Teachers Association

Fellow of the International Society of Design & Development in Education (ISDDE)

Fresno and Madera Mathematics Educators (FaMME) a local affiliate of the California Mathematics Council: Co-founder, Office held: Secretary (until 2018)

Fresno IdeaWorks Steering Committee
Mathematical Association of America (MAA)
Society for Industrial and Applied Mathematics (SIAM)
National Council of Teachers of Mathematics (editorial review for the Mathematics Teacher and
Journal for Research in Mathematics Education)

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