

COREY E. BRADY

PERSONAL INFORMATION

Assistant Professor, Learning Sciences
Peabody School of Education
Department of Teaching and Learning
Vanderbilt University
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AREAS OF SPECIALIZATION

Mathematics Education, Science Education, Computational Thinking, Learning & Design,
Learning Sciences

EDUCATION

University of Massachusetts Dartmouth, Dartmouth, MA 2010 - 2013
PhD Mathematics Education. Thesis: Perspectives in Motion. 2013
Thesis advisor: *Prof. Stephen Hegedus*

University of Virginia, Charlottesville, VA 1994 - 1999
M.A. in English language and literature 1996
ABD in Victorian cultural studies and the British Victorian novel 1996 - 1999
Advisor, *Prof. Michael Levenson*

University of Chicago, Chicago, IL 1992 - 1994
M.S. Pure Mathematics 1993
PhD area, Algebraic Topology 1993 - 1994
Advisor, *Prof. Peter May*

Dartmouth College, Hanover, NH 1987 - 1990
B.A. in Mathematics and English Literature 1990
Phi Beta Kappa, summa cum laude

PROFESSIONAL EXPERIENCE, UNIVERSITY LEVEL

Vanderbilt University, Nashville, TN 2016 - Present
Assistant Professor of the Learning Sciences
Department of Teaching and Learning
Peabody School of Education
Secondary Appointment, Computer Science 2018

Northwestern University, Evanston, IL 2014 - 2016
Research Assistant Professor, Learning Sciences
School of Education and Social Policy (SESP)
Center for Connected Learning (CCL) and Computer-Based Modeling
Faculty Member 2014 - 2016
Fellow (pre-Doctoral) 2010 - 2013

University of Massachusetts Dartmouth, Dartmouth, MA 2009 - 2014
Advisory Board Member & Research Scientist (Adjunct)
Kaput Center for Research and Innovation in STEM Education

PROFESSIONAL EXPERIENCE, OTHER EMPLOYMENT

Inquire Learning, LLC, Wilmette, IL 2007 - 2016
President

Software and curriculum design and development,
for projects in the US and internationally.
Research and teacher professional development on classroom
integration of technology, focused in Latin America.

LearningSoft, LLC, Fort Lauderdale, FL 2006 - 2007
Chief Education Officer
Product design and development
Research and pilot site management

Texas Instruments, Dallas, TX 2001 - 2006
Development team lead and
Product Line Strategy Manager, TI-Navigator
Product strategy
Product design and development
Education research community liaison

Boxer Learning, LLC, Charlottesville, VA 1995 - 2001
Chief Operating Officer and Chief Education Officer 1999 - 2001

Product design and content editing
Business development & general management
Curriculum Author & Director of Research 1995 – 1998
Interactive lesson design and development for middle & high school math

Piedmont Virginia Community College, Charlottesville, VA 1994 - 1996
Adjunct faculty member
Calculus instructor (Summer Semester Intensive Sessions)

The Roxbury Latin School, West Roxbury, MA 1990-1992
Master (i.e., Teacher): Mathematics, English, and Physical Science.
Taught BC Calculus, Pre-Calculus, Geometry;
9th Grade English; and 8th Grade Physical Science.

PUBLICATIONS (*STUDENTS)

Articles

In Revision, In Press, or Published

1. *Pierson, A., Clark, D., & Brady, C. (Status: Revisions Requested, In process). Syncretic Integration of Modeling and Translanguaging. Submitted to the *Journal of the Learning Sciences*.
2. Brady, C. & Lehrer, R. (Status: Revisions Requested, Submitted). Sweeping Area across Physical and Virtual Environments. *Digital Experiences in Mathematics Education (DEME)*
3. *Pierson, A. E., Brady, C. E., & Clark, D. B. (2019). Balancing the environment: Computational models as interactive participants in a STEM classroom. *Journal of Science Education and Technology*, 1-19.
4. Hjorth, A., Head, B., Brady, C., & Wilensky, U. (2020). LevelSpace: A NetLogo Extension for Multi-Level Agent-Based Modeling. *Journal of Artificial Societies and Social Simulation*, 23(1), 1-4.
5. White, T., Brady, C., Huang, J., & Stevens, M. (2019). A Distributed-by-Design Approach to Supporting Collaborative Learning with Dynamic Mathematics Software. *Educational Designer* 3(12).
6. *Vogelstein, L, Brady, C., & Hall, R. (2019). Reenacting mathematical concepts found in large-scale dance performance can provide both material and method for ensemble learning. *ZDM Mathematics Education*. 51(2).
7. Brady, C, *Blough, R., *Hollister, K., *Jordan, P., *Marshall, S., *Nichols, I., *Vogelstein, L., & *Wisittanawat, P. (2019). Clockface polygons and the collective joy of making mathematics together. *The Mathematics Enthusiast*. 16(1).
8. Brady, C., (2018). Modeling and the Representational Imagination. *ZDM Mathematics Education* 50(1-2), 45-59.
9. Moreno-Armella, L., Brady, C., & Elizondo, R. (2018). Dynamic Hyperbolic Geometry: Building intuition and understanding mediated by a Euclidean model. *International Journal of Mathematical Education in Science and Technology*, 49(4), 594-612.
10. Soylu, F., Holbert, N., Brady, C., & Wilensky, U. (2017). Phenomenological Connectors for Embodied Perspective Taking across Levels in Complex Systems. *Journal of Interactive Learning Research*, 28(3), 269-303.
11. Brady, C., Orton, K., Weintrop, D., Anton, G., Orton, K., Rodriguez, S., & Wilensky, U. (2017). All roads lead to computing: Making, participatory simulations, and social computing as pathways to computer science. *IEEE Transactions on Education*, 60(1), 59-66
12. Clark, D. B., Virk, S., Sengupta, P., Brady, C., Martinez-Garza, M., Krinks, K., Killingsworth, S., Kinnebrew, J., Biswas, G., Barnes, J., Minstrell, J., Nelson, B., Slack, K., & D'Angelo, C. (2016). SURGE's evolution deeper into formal representations: The siren's call of popular game-play mechanics. *International Journal of Designs for Learning*, 7(1), 107-146.
13. Brady, C., Holbert, N. R., Novak, M., Soylu, F., & Wilensky, U. (2015). Sandboxes for model-based inquiry. *Journal of Science Education and Technology*, 24(2-3): 265-286.

14. Clark, D., Sengupta, P., Brady, C., Martinez-Garza, M., & Killingsworth, S. (2015). Disciplinary Integration of Digital Games for Science Learning. *International Journal of STEM Education* [Special Issue]: 1-21.
15. Brady, C. & Lesh, R. (2015). A Modeling Approach to Risk and Uncertainty. *The Mathematics Enthusiast* (TME) [Special Issue, *Risk: Mathematical and Otherwise*] 12 (1, 2 & 3): 184-202.
16. Brady, C., Eames, C., & Lesh, R. (2015). Connecting Real-World and In-School Problem-Solving Experiences. *Quadrante: Revista de Investigação em Educação Matemática* [Special Issue, *Problem Solving*], 26(2), 5-38.
17. Jung, H. & Brady, C. (2015). Roles of a teacher and researcher during in situ professional development around the implementation of mathematical modeling tasks. *Journal of Mathematics Teacher Education* (JMTE) [Special Issue, *Mathematics Teachers as Partners in Task Design*]: 1-19.
18. Wilensky, U., Brady, C., & Horn, M. (2014). Fostering computational literacy in science classrooms. *Communications of the ACM*, 57(8), 24-28.
19. Abrahamson, L. & Brady, C. (2014). A brief history of network classrooms to 2013: Effects, cases, pedagogy and implications with new developments. *International Journal of Quality Assurance in Engineering and Technology Education* (IJQAETE). 3(3): 1-54.

In Review or in Preparation

1. *Johnson, P., Brady, C., et al. (Status: in Review, at Risk Analysis). A factor analysis approach to unifying community vulnerability and resilience indices for natural hazards. In preparation. Submitted to *Risk Analysis*.
2. Borromeo Ferri, R., Brady, C., & Lesh, R. (In preparation for MTL). “Roles for intuition in Mathematical Modelling: Theoretical conceptualizations and empirical reconstructions.” For Special Issue, A psychologically-driven view on mathematical modelling processes, *Mathematical Thinking and Learning*.
3. Brady, C. & Jung H. (In preparation for ESM). “Modelling Presentations: Measuring modelling competencies at the whole-class level.” for Special Issue, Innovations in measuring and fostering modelling competencies, *Educational Studies in Mathematics*.
4. Lee, O., Brady, C., et al (Status: in preparation for *Science and Education*). Integration of Science, Language, and Computational Thinking with English Learners.
5. Brady, C., Gresalfi, M., Knowe, M., *Vogelstein, L., & Steinberg, S. Debugging for Art’s Sake: Agent-based thinking in a debugging context. (Status: in preparation, for ACM: Transactions on Computing Education (TOCE)).
6. Brady, C., Camp, J., Gilligan, J., & Sengupta, P. (Status: in preparation, JASSS) Title: An agent-based participatory simulation to evoke expert and novice stakeholders’ knowledge, reasoning, and perspectives on urban flood risk.

7. Sengupta-Irving, T., *Vogelstein, L., Brady, C., & Phillips Galloway, E. (Status: in preparation for *Pedagogy*). The making of expansive possibilities. *American Educational Research Journal*
8. Jung, H. & Brady, C. (Status: in preparation, JRME). Working title: Group Presentations as a site for collective mathematical activity.
9. Brady, C. (Status: in preparation, IJCSCL). Anti-panopticon: Group dynamics with collective learning technologies.
10. *Pierson, A., Brady, C., Clark, D., & Sengupta, P. (Status: in preparation). Hybridized systems models of ecosystems.
11. Brady, C., Haas, A., & Lee, O. (Status: in preparation). Metamodeling in Fifth-Graders' Computational Modeling Constructions.
12. Brady, C. & *Vogelstein, L. (Status: in Preparation). Title: Taking the Patch Perspective: A comparative analysis of a patch based participatory simulation.

REFEREED CONFERENCE PROCEEDINGS

Presented

1. Brady, C. & Jung, H. (2019). Class presentations of modelling solutions: A setting for individual and group modelling competencies. ICTMA 2019.
2. Brady, C., & Jung, H. (2019). Group presentations as a site for collective modeling. Brief research report, PME-NA 2019.
3. Brady, C., Baker, C., Dominguez, A., Glancy, A., Jung, H., McLean, J., &. (2019) Models and modeling working group. Working group, PME-NA 2019.
4. *Nichols-Paez, I., & Brady, C. (2019). Infrastructure to support students exercising conceptual agency. Full research report, PME-NA 2019.
5. *Reimers, J., & Brady, C. (2019). Maggie Mars: Using theatrical embodiment to promote interpretive claims about solar systems. Full paper, *Computer Supported Collaborative Learning (CSCL 2019)*.
6. *Vogelstein, L. & Brady, C (2019). Taking the patch perspective: A comparative analysis of a patch-based participatory simulation. Full paper, *Computer Supported Collaborative Learning (CSCL 2019)*.
7. *Nichols-Paez, I. & Brady, C. (2019). Collaboration within Mathland: What do We become Together. Poster, *Computer Supported Collaborative Learning (CSCL 2019)*.
8. Petrosino, T., Sherard, M., & Brady, C. (2019). Using Collaborative Agent-based Modeling to Explore Complex Phenomena with Preservice Teachers. Poster, *Computer Supported Collaborative Learning (CSCL 2019)*.

9. Gresalfi, M., *Bell, A., Brady, C., & *Vogelstein, L. (2019). Theorizing and Measuring Collective Productive Disciplinary Engagement. Symposium, *Computer Supported Collaborative Learning (CSCL 2019)*.
10. Brady, C., Eames, C., Jung, H., Glancy, A., McLean, J., & Dominguez, A. (2018) Models and modeling working group. Proceedings of PME-NA 2018.
11. Brady, C., Jones, R., Nichols, I., & Wisittanawat, P. (2018). Positive Interdependence through Data Modeling. Proceedings of PME-NA 2018.
12. *Gendron, C., *Nichols, I., & Brady, C. (2018). An exploration in doing collaborative unsolved mathematics. Poster, in Proceedings of PME-NA 2018.
13. Hjorth, A., Brady, C., & Wilensky, U. (2018). Sharing is Caring in the Commons – Students’ Conceptions about Sharing and Sustainability in Social-Ecological Systems. Proceedings of Constructionism 2018, Vilnius, Lithuania (August 21-25).
14. Brady, C., Broll, B., & Ledeczi, A. (2018). NetsBlox: A Constructionist Environment for Creating Distributed Applications. Proceedings of Constructionism 2018, Vilnius, Lithuania (August 21-25).
15. Brady, C., Stroup, W., Petrosino, A., & Wilensky, U. (2018). Group-based Simulation and Modelling: Technology Supports for Social Constructionism. Proceedings of Constructionism 2018, Vilnius, Lithuania (August 21-25).
16. Wendel, D. et al. (2018). Integrating Computational Modeling into K-12 Science Classrooms. Symposium for the Connected Learning Conference, 2018.
17. Sengupta-Irving, T., *Vogelstein, L., Brady, C., & Phillips-Galloway, E. (2018). Mentors in the Making: A Case Study of Heterogeneity in Meaning Making at a Public Library Makerspace. Poster at the International Conference for the Learning Sciences, 2018.
18. *Vogelstein, L., Hall, R., & Brady, C. (2018). Unfolding Joy: Expressive Mathematics in Ensemble Performance. Part of Scipio, D., Kiefert, D., et al. Pedagogies of Joy: Possibilities of Joy for Expansive Learning. Submitted for the International Conference for the Learning Sciences, 2018.
19. Clark, D., Medlock-Walton, P., Sengupta, P., Brady, C., & Klopfer, E. (2017). Prototypes of Collaborative Agent-based Disciplinarily-Integrated Games for Integrated STEM Education. Paper presented at the International Society for STEM in Education (ISSE)’s 2017 ISSE Symposium "STEM as Critical Literacies". September 27-30.
20. *Vogelstein, L., Brady, C., & Hall, R. (2017). Embodied Mathematical Technologies: Making Sense of Ensemble-Based Embodied Mathematical Thinking and Learning. Paper presented at the 47th Annual Meeting of the Jean Piaget Society, June 8-10, 2017, San Francisco, CA.

21. *Vogelstein, L., Brady, C., & Hall, R. (2017). Mathematical reflections: The design potential of ensemble performance. Paper presented at the 16th Interaction Design and Children conference (IDC 2017), June 27-30, Palo Alto, CA.
22. *Vogelstein, L., Brady, C., & Hall, R. (2017). Putting our bodies on the line: Mathematizing ensemble performances. Brief research report, PME-NA 2017.
23. Brady, C., Eames, C., Jung, H., Glancy, A., McLean, J., & Dominguez, A. (2017) Models and modeling working group. Working group, PME-NA 2017.
24. Wagh, A., Guo, B., Brady, C., Horn, M., Levy, S., & Wilensky, U. (2017). Anchor code and other forms of computational and conceptual learning about evolutionary change in a code-first environment. CSCL 2017.
25. Brady, C., McLean, J., Dominguez, A., Glancy, A., & Jung, H. (2017). A Comparative Analysis of Learners' Models from Multiple Perspectives via a Cross-Institutional Collaborator Network. 18th International Conference on the Teaching of Mathematical Modelling and Applications (ICTMA-18), July 24-30, Cape Town, South Africa.
26. Brady, C., Dominguez, A., Glancy, A., Jung, H., McLean, J., & Middleton, J. (2016). Models and Modeling working group. Working group Proceedings of the 38th annual conference of the North American chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Tucson, AZ, November 5-8.
27. Brady, C., Eames, C., & Jung, H. (2016). Design principles for curricular sequences focused on models and modeling. Paper Presented at TSG 36 "Task design, analysis and learning environments" ICME13, Hamburg, July 24-31.
28. Guo, Y., Wagh, A., Brady, C., Levy, S. T., Horn, M. S., & Wilensky, U. (2016). Frogs to Think with: Improving Students' Computational Thinking and Understanding of Evolution in A Code-First Learning Environment. *Proceedings of the 15th International Conference of ACM SIGCHI Interaction Design and Children (IDC 2016)*. ACM, New York, NY, USA, 246-254. DOI: <http://dx.doi.org/10.1145/2930674.2930724>
29. Brady, C., Weintrop, D., Anton, G., & Wilensky, U. (2016). Constructionist Learning at the Group Level with Programmable Badges. Proceedings of the Constructionism 2016 Conference. Bangkok, Thailand.
30. Hjorth, A., Brady, C., Head, B., & Wilensky, U. (2016). Turtles All the Way Down: Presenting LevelSpace, a NetLogo Extension for Reasoning about Complex Connectedness. Paper Presented at Constructionism 2016, Constructionism in Action. Bangkok, Thailand, Feb 1-5, 2016.
31. Gilligan, J., Brady, C., Camp, J., Nay, J., & Sengupta, P. (2015). Participatory Simulations of Urban Flooding for Learning and Decision Support. In L. Yilmaz, W. K V. Chan, I. Moon, T. M. K. Roeder, C. Macal, and M. D. Rossetti, eds, *Proceedings of the 2015 Winter Simulation Conference*, Huntington Beach, CA.
32. Head, B., Hjorth, A., Brady, C., & Wilensky, U. (2015). Evolving Agent Cognition with NetLogo Levelspace. In L. Yilmaz, W. K V. Chan, I. Moon, T. M. K. Roeder, C.

- Macal, and M. D. Rossetti, eds, *Proceedings of the 2015 Winter Simulation Conference*, Huntington Beach, CA.
33. Brady, C., Weintrop, D., Anton, G., Gracey, K., & Wilensky, U. (2015) Learning at the Intersection of Personal Expression, Social Computing, and Wearable Design with Programmable Badges. Proceedings of SIGITE / RIIT conference.
 34. Brady, C., Jung, H., & Eames, C. (2015). Models and Modeling working group. Working group Proceedings of the 37th annual conference of the North American chapter of the International Group for the Psychology of Mathematics Education (PME-NA), East Lansing, MI.
 35. Hjorth, A, Brady, C., Head, B, & Wilensky, U (2015) LevelSpaceGUI - Scaffolding Novice Modelers' Inter-Model Explorations. In *Proceedings of Interaction Design and Children (IDC'15)*, ACM Press: Boston, MA.
 36. Hjorth, A., Brady, C., Head, B., Wilensky, U. (2015). Thinking Within and Between Levels: Exploring Reasoning with Multi-Level Linked Models. In T. Koschmann, P. Häkkinen, & P. Tchounikine (Eds.), "Exploring the material conditions of learning: opportunities and challenges for CSCL," the Proceedings of the Computer Supported Collaborative Learning (CSCL) Conference Gothenburg, Sweden: ISLS.
 37. Horn, M., Brady, C., Hjorth, A., Wagh, A., & Wilensky, U. (2014, June). Frog Pond: A Code-First Learning Environment on Evolution and Natural Selection. In *Proceedings of Interaction Design and Children (IDC'14)*, ACM Press (2014): Aarhus, Denmark.
 38. Sengupta, P., Killingsworth, S., Krinks, K., Brady, C., & Clark, D. (2014). Integrating Modeling with Games for Learning Newtonian Mechanics. In Penuel, W., Jurow, S., & O'Connor, K. (Eds.) *Learning and Becoming in Practice: Proceedings of the 11th International Conference of the Learning Sciences (ICLS 2014) – Vol. 2, Short Papers, Symposia, and Selected Abstracts*. Boulder, CO: International Society of the Learning Sciences.
 39. Brady, C., Horn, M., Wilensky, U., Wagh, A., Hjorth, A., & Banerjee, A. (2014). Getting your Drift – Activity designs for grappling with evolution. In Penuel, W., Jurow, S., & O'Connor, K. (Eds.) *Learning and Becoming in Practice: Proceedings of the 11th International Conference of the Learning Sciences (ICLS 2014) – Vol. 2, Short Papers, Symposia, and Selected Abstracts*. Boulder, CO: International Society of the Learning Sciences.
 40. Clark, D. & Brady, C. (2014). Evolving and Balancing Informal and Formal Representations. Poster for Interactive Poster session, "Content, Process, Affect: Approaches to Scaffolding in Exploratory Learning Environments to support STEM learners." In Penuel, W., Jurow, S., & O'Connor, K. (Eds.) *Learning and Becoming in Practice: Proceedings of the 11th International Conference of the Learning Sciences (ICLS 2014) – Vol. 2, Short Papers, Symposia, and Selected Abstracts*. Boulder, CO: International Society of the Learning Sciences.
 41. Holbert, N., Weintrop, D., Wilensky, U., Sengupta, P., Killingsworth, S., Krinks, K., & Brady, C. (2014). Combining Video Games and Constructionist Design to Support Deep Learning in Play. In Penuel, W., Jurow, S., & O'Connor, K. (Eds.) *Learning and*

Becoming in Practice: Proceedings of the 11th International Conference of the Learning Sciences (ICLS 2014) – Vol. 2, Short Papers, Symposia, and Selected Abstracts. Boulder, CO: International Society of the Learning Sciences.

42. Brady, C., Wilkerson-Jerde, M., & Lesh, R. (2011). Models and modeling working group. Working group at the 33rd annual conference of the North American chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Reno, NV.
43. White, T., & Brady, C. (2010). Space and time in classroom networks: Mapping conceptual domains in mathematics through collective activity structures. In K. Gomez, L. Lyons & J. Radinsky (Eds.), *Learning in the Disciplines: Proceedings of the 9th International Conference of the Learning Sciences (ICLS 2010)* (pp. 1008-1015). Chicago, IL: University of Illinois at Chicago.

Accepted

1. *Pierson, A., Clark, D., & Brady, C. (Status, Accepted: 2020). Languages of Modeling, Modeling in Languages: Integrating Science and Translanguaging. Paper Presented at the NARST Annual International Conference.
2. Jung, H., Brady, C., McLean, J, (Status, Accepted: 2020). Presentations and Reflective Discourse. Submitted to ICME14
3. McLean, J, Brady, C., Jung, H. (Status, Accepted: 2020). Investigating students' data moves in a citizen science based data-rich model-eliciting activity. Submitted to ICME 14
4. Anderson, C., Brady, C., Broll, B., & Ramey, L. (Status, Accepted: 2020) Human-Centered Computing for Humanists: Case Studies from the Computational Thinking and Learning Initiative at Vanderbilt University. Submitted to DH2020, Ottawa, Canada.
5. Brady, C. & *Vogelstein, L. (Status, Accepted: 2020). Patches as an Expressive Medium for Agent-Based Modelling and Programming. Full Paper, Constructionism 2020.
6. *Reimers, J. & Brady, C. (Status, Accepted: 2020). Theatrical modeling. Full Paper, Constructionism 2020
7. Brady, C. & *Yarnes, L. (Status, Accepted: 2020). Embodied Participatory Simulations of Disease as an Entry Point for Network Analysis. Ignite Poster, Constructionism 2020.
8. Ledeczi, A., Broll, B., & Brady, C. (Status, Accepted: 2020). Make Your Own Data Service Workshop. (Status, Accepted: 2020). Workshop, Constructionism 2020.
9. Ledeczi, A., Broll, B., & Brady, C. (Status, Accepted: 2020). Advanced Yet Accessible CS Concepts in K12. (Status, Accepted: 2020). Ignite Demonstration. Constructionism 2020.
10. Brady, C., Gresalfi, M., Steinberg, S., & Knowe, M. Debugging for art's sake: Beginning programmers' debugging activity in an expressive coding context. Long Paper, ICLS 2020.

11. Brady, C., Haas, A., Lee, O. (Status, Accepted: 2020). Modeling and Meta-Modeling in Elementary Science Learning: Physical, Diagrammatic, and Computational Models. Long Paper, ICLS 2020.
12. *Pierson, A., Clark, D., & Brady, C. (Status, Accepted: 2020). Modeling in Languages, Languages of Modeling: Integrating Science Practices and Translanguaging Practices. Long Paper, ICLS 2020.
13. *Pierson, A., Brady, C. & Clark, D. (Status, Accepted: 2020). Hybrid Modeling in 6th Grade STEM: Seeds of Convergence Research. Long Paper, ICLS.
14. *Reimers, J. & Brady, C. (Status, Accepted: 2020). Theatrical modeling as a design for perspectival learning, Poster, ICLS 2020
15. Gresalfi, M., Brady, C., Knowe, M., & Steinberg, S. (Status, Accepted: 2020). Engaging in a new practice: What are students doing when they are “doing” debugging? Long Paper, ICLS 2020.
16. Sengupta-Irving, T., *Vogelstein, L., Brady, C., & Phillips Galloway, E. (Status, Accepted: 2020). Exploring the Pedagogical Moves of Artist Mentors in Democratizing and Diversifying Maker Education. Short Paper, ICLS 2020.

BOOK CHAPTERS

Accepted or Published

1. Brady, C. & Lesh, D. (in Press, 2020). Development in Mathematical Modeling. In English L et al (eds). Modeling in the Elementary Grades.
2. Brady, C., McLean, J., Jung, H., Glancy, A., & Dominguez, A. (in Press, 2020). Investigating the Complexity of Student Modelling by Coordinating a Diversity of Research Perspectives. In G. Stillman, G. Kaiser & E. Lampen (Eds), *Mathematical Modelling Education and Sense Making*. Springer.
3. Sevinc, S., & Brady, C. (2019). Kindergarteners’ and First-Graders’ Development of Numbers Representing Length and Area: Stories of Measurement. In K. Robinson, H. Osana, & D. Kostopoulos (Eds), *Mathematical Learning and Cognition in Early Childhood* (pp. 115-137). Springer, Cham.
4. Eames, C., Brady, C., Jung, H., Glancy, A., & Lesh, R. (2018). Designing Powerful Environments to Examine and Support Teacher Competencies for Models and Modelling. In *Lehrerkompetenzen zum Unterrichten mathematischer Modellierung* (pp. 237-266). Springer Spektrum, Wiesbaden.
5. Moreno-Armella, L., & Brady, C. (2018). Technological Supports for Mathematical Thinking and Learning: Co-action and Designing to Democratize Access to Powerful Ideas. In L. Ball et al. (eds.), *Uses of Technology in Primary and Secondary Mathematics Education, ICME-13 Monographs*. Springer.

6. Brady, C., Eames, C., & Lesh, R. (2018). The Student Experience of Model Development Activities: Going Beyond Correctness to Meet a Client's Needs. In *Evaluierte Lernumgebungen zum Modellieren* (pp. 73-92). Springer Spektrum, Wiesbaden.
7. Hegedus, S., Laborde, C., Brady, C., Dalton, S., Siller, H., Tabach, M., Trgalova, J., & Moreno-Armella, L. (2017). *Uses of technology in upper secondary mathematics education* ICME 13 Topical Survey (Gabriele Kaiser, Series Editor). Springer International Publishing AG: Switzerland.
8. Eames, C., Brady, C., & Lesh, R. (2016). Formative Self-Assessment: A Critical Component of Mathematical Modeling. In C. Hirsch (ed.) 2016 Annual Perspectives in Mathematics Education (APME): *Mathematical Modeling and Modeling Mathematics*.
9. Brady, C., Lesh, R., & Sevinc, S. (2015). Extending the reach of the Models and Modeling Perspective: A course-sized research site. In M. Biembengut, G. Stillman, & W. Blum (Eds.) *Mathematical Modelling in Education Research and Practice: Cultural, Social and Cognitive Influences*. (ICTMA Series, International Perspectives on the Teaching and Learning of Mathematical Modelling).
10. Brady, C., White, T., Davis, S., & Hegedus, S. (2013). SimCalc and the networked classroom. In S. Hegedus & J. Roschelle (Eds.), *The SimCalc vision and contributions: Democratizing access to important mathematics* (pp. 99-121). New York, NY: Springer.

Other Publications

1. Gonzales Prado, N., Trelles, C., Brady, C., Sánchez, M. & Barrazueta, J. (2019). *ACTIVIDADES PARA CLASES CON DESMOS, Manual del Profesor*. Proyecto DIUC: La modelación con apoyo de software libre y los cambios en los procesos de aprendizaje en matemáticas en los estudiantes de Primero de Bachillerato. Cuenca, Ecuador: Universidad de Cuenca.
2. Gonzales Prado, N., Trelles, C., Brady, C., Sánchez, M. & Barrazueta, J. (2019). *DESMOS, Manual del Usuario*. Proyecto DIUC: La modelación con apoyo de software libre y los cambios en los procesos de aprendizaje en matemáticas en los estudiantes de Primero de Bachillerato. Cuenca, Ecuador: Universidad de Cuenca.
3. Gonzales Prado, N., Trelles, C., Brady, C., Sánchez, M. & Barrazueta, J. (2019). *TRACKER, Manual del Usuario*. Proyecto DIUC: La modelación con apoyo de software libre y los cambios en los procesos de aprendizaje en matemáticas en los estudiantes de Primero de Bachillerato. Cuenca, Ecuador: Universidad de Cuenca.
4. Brady, C. & Lesh, R. (2014). Model Development at the Whole-Course Level. In Carmona, G (ed), *Proceedings of the 1st Campus Viviente in STEM Education Symposium*. San Antonio, TX: UTSA.
5. Brady, C. (2010). El aprendizaje colaborativo con tecnología. *Innovaciones Educativas*. Texas Instruments.

6. Brady, C., Millner, M., Mitric, A., & Siegel, D. (1999). Hypertext and Literary Learning. *Currents in Electronic Literacy* 1(1).
7. Brady, C. (1998). Victorian anesthetics and the issue of control. *Bulletin of Anesthesia History*, 16(4), 14-17.

OTHER SCHOLARLY PRESENTATIONS & ACTIVITY

Refereed Conference Presentations

1. Brady, C., Stroup, W., Cannady, J., Petrosino, A., & Wilensky, U. (2019) Generative modeling in computer science. In Symposium, Supporting Modeling Epistemologies in the Science Classroom. AERA 2019.
2. Sherard, M., Harron, J., Petrosino, A., Brady, C., Stroup, W., & Wilensky, U. (2019) Developing preservice teachers' conceptualization of models and simulations through Group-based Cloud Computing. AERA 2019.
3. *Pierson, A., Brady, C., & Clark, D. (2019) Computational Models as Multimodal Participants with Emerging Bilingual Students. In Symposium, Multimodal STEM Learning with Emerging Bilingual Students. AERA 2019.
4. *Pierson, A., Brady, C., & Clark, D. (2019) Balancing the Environment: Computational Models as Interactive Participants in a STEM Classroom. AERA 2019. Winner, Best Student Paper award, Advanced Technologies for Learning/Learning Sciences SIG.
5. Sengupta-Irving, T., *Vogelstein, L., Brady, C., & Phillips-Galloway, E. (2019). Democratizing What: A Case Study of How Mentors in a Public Library Makerspace Organize Toward Expansive Possibilities. Paper presented at AERA 2019.
6. *Vogelstein, L., Hall, R., & Brady, C. (2019). Unfolding Joy: Expressive Mathematics in Ensemble Performance. Paper presented at AERA 2019.
7. *Vogelstein, L., Hall, R., & Brady, C. (2019). Physical Research: The Mathematical Potential of Dancers' Professional Practices. Paper presented at AERA 2019.
8. Kim, B., Clark, D., Sengupta, P., Lock, J., Shanahan, M., Bastani, R., Medlock-Walton, P., Brady, C., & Klopfer, E. (2018, May). Empowering students as designers and players: How learners shape and transform what it means to learn. Paper to be presented at the 2018 Conference of the Canadian Society for the Study of Education (CSSE 2018).
9. Brady, C., Holbert, N., & Wilensky, U. (2017, April). "The Sustainability of Instructional Innovations as an Emergent Property of the Systems that Implement them" (paper in interactive session, "Supporting Science as a Modeling Practice in the Classroom through the Lens of NGSS"). Paper presented at AERA 2017.
10. Pei, C., Brady, C., & Wilensky, U. (2017, April). "What I Can and Cannot Do:" Self-Assessment and Learners' Construction of Agentive Selves in Physical Computing. Paper presented at AERA 2017.

11. Guo, Y., Wagh, A., Levy, S. T., Brady, C., Horn, M. S., & Wilensky, U. (2017, April). Using learning analytics to characterize programming practices in a code-first environment for learning about evolution. Poster presented at AERA 2017
12. Gibson, Z., Anton, G., Vermeer, W., Gómez-Zara, D., Bain, C., Brady, C., DeChurch, L.A., Wilensky, U., & Contractor, N. (2017). Cultivating the conference culture: The role of diversity in interdisciplinary meetings. Presented at the First North American Social Networks (NASN) Conference, Washington, D.C., July 26 – July 30.
13. Gómez-Zara, D., Vermeer, W., Gibson, Z., Bain, C., Anton, G., Brady, C., DeChurch, L.A., Wilensky, U., & Contractor, N. (2017). The role of brokers in academic network building. Presented at the First North American Social Networks (NASN) Conference, Washington, D.C., July 26 – July 30.
14. Moreno-Armella, L., & Brady, C. (2016). Theory. For TSG 43, "Uses of technology in upper secondary mathematics education" ICME13, Hamburg, July 24-31, 2016.
15. Gilligan, J., Nay, J., Brady, C., Sengupta, P., & Camp, J. (2015). Emotional engagement with participatory simulations as a tool for learning and decision-support for coupled human-natural systems: Flood hazards and urban development. AGU Fall Meeting, San Francisco, CA: December.
16. Holbert, N., Brady, C., Soylu, F., Novak, M., & Wilensky, U. (2015). *The Models Gallery: Supporting Idea Diffusion in Computational Modeling Activities*. Poster presented at the AERA Annual Meeting, Chicago, IL: April.
17. Novak, M., Brady, C., & Cook, K. (2015). *Modeling Key Mechanisms of Evolution and Population Biology*. Short course at the NSTA National Conference, Chicago, IL: April.
18. Soylu, F., Brady, C., Holbert, N., & Wilensky, U. (2014). *The thinking hand: Embodiment of tool use, social cognition and metaphorical thinking and implications for learning design*. Paper presented at the AERA Annual Meeting (SIG: Brain, Neurosciences, and Education), Philadelphia, PA: April, 2014.
19. Brady, C. & Davis, S. (2008). *Generative activities with TI-Navigator*. Paper presented at the joint meeting of the 32nd conference of the International Group for the Psychology of Mathematics Education and the XX North American Chapter (PME-NA), Morelia, MX.
20. Brady, C (2008). Discussant and response, for *Exploring frameworks for capturing students' mathematical identities in diverse classroom settings*. Session at the annual meeting of the American Educational Research Association (AERA), New York, NY.
21. Brady, C. (2006). Discussant and response, for *Making a difference with attention to content, technology, and scale: A session honoring the memory of Jim Kaput*. Session at the International Conference of the Learning Sciences (ICLS), Bloomington, IN.

22. Brady, C. & Kajder, S. (2003). *Teacher as scholar meets scholar as teacher*. Paper presented at the annual convention of the National Council of Teachers of English (NCTE), San Francisco, CA.
23. Brady, C., (2003). *Making reading visible*. Paper presented at the annual convention of the Modern Language Association (MLA), San Diego, CA.

Accepted

1. Brady, C., Stroup, W., Petrosino, A., & Wilensky, U. (Accepted, 2020). "Amplifying the restructuration potential of agent-based modeling through group-based activity structures." in *Restructuring Concepts and Tools through a Complexity Perspective*. Presentation at AERA2020.
2. Brady, C., & Ledeczi, A. (Accepted, 2020). "Teaching Advanced CS Concepts in High School." In *Power in the Plurality of Pedagogies & Partnerships in 'Computer Science For All.'* Presentation at AERA2020.
3. *Pierson, A., Brady, C. & Clark, D. (Accepted, 2020). "Seeds of Hybrid Modeling in Design-Oriented STEM." In *Thinking Across Representations: Designing to Support Investigations that Leverage Physical and Computational Modes of Inquiry*. Presentation at AERA2020.
4. *Pierson, A., Clark, D., & Brady, C. (Accepted, 2020). "Parallel Practices: Translanguaging and Scientific Modeling." In *Translanguaging and Disciplinary Literacies: Exploring and Leveraging Translanguaging across Disciplinary Contexts*. Presentation at AERA2020.
5. *Pierson, A., Clark, D., & Brady, C. (Accepted, 2020). "'Languages' of Science: Computational Modeling for Reasoning and Expression with Emerging Bilingual Students in Middle School" In *A New Generation of Goals for Scientific Modeling: Strategies and Lessons Learned for Reach and Impact*. Presentation at AERA2020.
6. *Reimers, J. & Brady, C. (Accepted, 2020). *Theatrical modeling: Hybridizing participatory theater and agent-based modeling to support student science practices*. Presentation at ISCAR 2020

PUBLISHED HARDWARE, SOFTWARE, AND CURRICULA

1. Brady, C. & White, T. (2019-2020). **MathNet 2.0**. A system for distributed-by-design collaborative teaching and learning of mathematics.
2. Brady, C., Lehrer, R., & Thompson, C. (2019-2020). **TOTs Observation Tool**. Construct-based teacher tool for gathering evidence of student learning and ways of thinking.
3. Lehrer, R., Burger, D., & Brady, C. (2019-2020). **Kidviz Dynamic Website**. Nashville, TN, Vanderbilt University
4. Brady, C. & Bertsche, J. (2019-2020). **Badge Server**. Data exchange for Internet-of-Things style distributed computing. Used for communications between Badge WX devices (see below) and NetLogo, NetsBlox environments.

5. Hardware: with Parallax, Inc. (2018-19) **BadgeWX** v. 2.0. Wearable, programmable, and hardware extensible computing platform. Software: with Parallax, Inc. (2018) **BlocklyProp**. Visual programming environment for Propeller chip powered platforms, including the BadgeWX.
6. Remmler, C., Brady, C., Stroup, W., Petrosino, T., & Wilensky, U. (2018-19). **Group-based Cloud Computing (GbCC)**, a collective learning environment for classroom activities across STEM, including computer science.
7. Brady, C. (2018-19). **NetLogo GbCC, Graph, Physics, and Maps extensions** for teacher authoring within the GbCC system. Nashville, TN. Crowd Learning Lab. Vanderbilt University.
8. Brady, C., Lehrer, R., & Brady, F. (2018-20). **Sweeping Area with Rotation**. Nashville, TN, Vanderbilt University
9. Brady, C. & Bertsche, J. (2018-2020). **Gallery Server**. Flexible environment for web-based collaboration and collective artifact production.
10. Brady, C., & Zhou, N. (2018). **NetLogo Bluetooth Extension**. Nashville, TN. Crowd Learning Lab. Vanderbilt University.
11. White, T. & Brady, C. (2017-18). **MathNet**. A system for distributed-by-design collaborative teaching and learning of mathematics.
12. Brady, C. & Clark, D. (2017). **CollabSNAP**. Collaborative web application built on the Snap programming environment. Nashville, TN, Vanderbilt University.
13. Brady, C. & Lehrer, R. (2016). **Sweeping Area**. Wilmette, IL and Nashville, TN, Inquire Learning and Vanderbilt University.
14. Brady, C. & Wilensky, U. (2015, 2016). **NetLogo View2.5D Extension**. Evanston, IL. Center for Connected Learning and Computer-Based Modeling (CCL), Northwestern University.
15. Brady, C. & Duncan, F. (2015). **NetLogo GoGo-HID Extension**. Evanston, IL. Center for Connected Learning and Computer-Based Modeling (CCL), Northwestern University.
16. Brady, C. (2014, 2015). **NetLogo GPIO Extension (pcDuino)**. Evanston, IL. Center for Connected Learning and Computer-Based Modeling (CCL), Northwestern University.
17. Brady, C. (2013). **NetLogo Arduino Extension**. Wilmette, IL. Inquire Learning.
18. Brady, C. (2013). **NetLogo Agentset Extension**. Wilmette, IL. Inquire Learning.
19. Brady, C. (2013). **NetLogo Leap Motion Extension**. Wilmette, IL. Inquire Learning.
20. Brady, C., Holbert, N. R., Novak, M., Soylu, F., & Wilensky, U. (2013). ModelSim Particulate nature of matter unit, for ModelSim Classroom implementations in 2013, 2014.

21. Wilensky, U., Brady, C., Holbert, N. R., Novak, M., & Soylu, F. (2012). ModelSim Particulate nature of matter unit, for ModelSim Classroom implementations in 2012.
22. **TI-Nspire Navigator 3.0, Review Workspace** (2011) [Computer Software]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
23. Hegedus, S. (2010). **SimCalc MathWorlds 3.0 Spanish** [Computer Software]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
24. **TI-Navigator 3.2 Spanish** (2009) [Computer Software]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
25. Brady, C., Milheron, P., & Moss, A. (2008). **Calculator HubNet for TI-Navigator 2.0 (Companion to NetLogo 4.0.2)** [Computer and Calculator Software]. Weston, FL. Inquire Learning.
26. **Indigo 2.0 Learning System** (2007) [Computer and Handheld Software and Hardware]. Fort Lauderdale, FL. LearningSoft, LLC. <http://www.learningsoft.net>.
27. Brady, C., Milheron, P., & Stroup, W. (2006). **MOTION app** [Calculator Software]. Dallas, TX. Texas Instruments.
28. **TI-Navigator 3.0 Classroom Learning System** (2006) [Computer and Calculator Software and Hardware]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
29. **TI-Navigator 2.2 Classroom Learning System** (2005) [Computer and Calculator Software and Hardware]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
30. **TI-Navigator 2.1 Classroom Learning System** (2005) [Computer and Calculator Software and Hardware]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
31. **TI-Navigator 2.0 Classroom Learning System** (2004) [Computer and Calculator Software and Hardware]. Dallas, TX. Texas Instruments. <http://education.ti.com>.
32. Devins, P., Oldham, S., & Brady, C. (2000). **Boxer Fundamental Math** [Website]. Charlottesville, VA. Boxer Learning. <http://www.boxermath.com>.
33. Brady, C., Oldham, S., & Devins, P. (1999). **Boxer Geometry** [Computer Software and Website]. Charlottesville, VA. Boxer Learning. <http://www.boxermath.com>.
34. Devins, P., Brady, C., & Oldham, S., (1999). **Boxermath.com** [Website]. Charlottesville, VA. Boxer Learning. <http://www.boxermath.com>.
35. Brady, C., Oldham, S., & Devins, P. (1998). **Boxer Intermediate Algebra** [Computer Software]. Charlottesville, VA. Boxer Learning. <http://www.boxermath.com>.
36. Oldham, S, Devins, P., & Brady, C. (1997). **Boxer Introductory Algebra** [Computer Software]. Charlottesville, VA. Boxer Learning. <http://www.boxermath.com>.
37. Koh, J., Oldham, S., Devins, P., & Brady, C. (1996). **Boxer Trigonometry** [Computer Software]. Charlottesville, VA. Boxer Learning. <http://www.boxermath.com>.

PATENTS AND PATENT DISCLOSURES

Milheron, P., Udayamurthy, S., Brady, C., Cole, D., Gupta, S., & Andrews, T. (2006). SYMMETRIC NETWORKING TO SUPPORT FLEXIBLE TEACHING. (**WO Patent #2006121987**)

Gupta, S., Andrews, T., Cole, D., Udayamurthy, S., Brady, C., & Milheron, P. (2004). MEMORY AND PROCESSOR EFFICIENT NETWORK COMMUNICATIONS PROTOCOL. (**US Patent # 8774184**)

Abrahamson, L., Brady, C., Jenks, R., Fry, M., & Wostrel, T. (2013). OPEN PARADIGM FOR INTERACTIVE NETWORKED EDUCATIONAL SYSTEMS.

Abrahamson, L., Brady, C., & Fry, M. (2009). METHOD AND APPARATUS FOR AGGREGATING, ANALYZING, PRESENTING, AND MANIPULATING PROCESS DATA FOR INSTRUCTIONAL PURPOSES.

Abrahamson, L., Brady, C., & Fry, M. (2009). METHOD AND APPARATUS FOR PRESENTING AGGREGATED DATA FOR INSTRUCTIONAL PURPOSES.

Abrahamson, L., Brady, C., & Fry, M. (2009). METHOD AND APPARATUS FOR AGGREGATING, PRESENTING, AND MANIPULATING DATA FOR INSTRUCTIONAL PURPOSES.

Brady, C., Gupta, S., Andrews, T., Cole, D., & Udayamurthy, S. (2009). NETWORK-SUPPORTED EXPERIMENT DATA COLLECTION IN AN INSTRUCTIONAL SETTING.

Brady, C. (2004). SYSTEM AND METHOD FOR VOICE SYNTHESIS USING AN ANNOTATION SYSTEM.

OTHER ACADEMIC PRESENTATIONS (INVITED)

1. Brady, C. (2018). Diseño como pedagogía. International planning meeting, Instituto Politécnico Nacional (IPN), Ciudad de México, MX.
2. Brady, C (2018). Co-instructor en la segunda sesión presencial del Módulo Pensamiento y Lenguaje Variacional, del Segundo Diplomado, *Estrategias para el Desarrollo del Pensamiento Matemático en el Nivel Medio Superior* (with María del Socorro Valero Cazarez and Jaime Maya, Instituto Politécnico Nacional (IPN), Ciudad de México, MX.
3. Brady, C. (2016) “Matemáticas Participativas: Desde el individuo hasta el grupo del aula.” 30° Reunión Latinoamericana de Matemática Educativa (RELME XXX). ITESM Campus Monterrey, Nuevo León, MX, June.

4. Gonzales, N., Trelles, C., & Brady, C. (2015) La modelación con apoyo de Software Libre, y los cambios en los procesos de aprendizaje en matemáticas en los estudiantes de primero de Bachillerato. Primer Congreso Internacional de Educación, Calidad y Buen Vivir. Cuenca, Ecuador.
5. Brady, C. (2015) La modelación con apoyo de Software Libre, y los cambios en los procesos de aprendizaje en matemáticas en los estudiantes de primero de Bachillerato. Congreso PROMETEO, SENESCYT de Ecuador. Universidad de Cuenca, Cuenca, Ecuador.
6. Brady, C. (2015) La modelación como lente al pensamiento matemático. [Congreso Interno], Universidad de Cuenca, Cuenca, Ecuador.
7. Brady, C. (2014) Aprendizaje “*construccionista*”: La modelación de sistemas complejos en las ciencias. 2º Congreso Internacional de Enseñanza en las Ciencias. ITESM Ciudad Madero, Tamaulipas, MX.
8. Brady, C. (2014) El problemática del estudiante de ingeniería (Panel Discussion). 2º Congreso Internacional de Enseñanza en las Ciencias. ITESM Ciudad Madero, Tamaulipas, MX.
9. Brady, C. (2012). Gráficos Cartesianos: Un acercamiento a través del movimiento. Paper presented at the Cuarto Simposio Latinoamericano para la Integración de la Tecnología en el Aula de Matemáticas y Ciencias, Ciudad de México, DF, MX.
10. Brady, C. (2012). “El aula es para compartir” Keynote presented at the Cuarto Simposio Latinoamericano para la Integración de la Tecnología en el Aula de Matemáticas y Ciencias, Ciudad de México, DF, MX.
11. Brady, C., (2012) “Aprendizaje basado en la participación estudiantil: Nuevos métodos y medios.” Keynote presented at the Primer Encuentro Internacional de Matemática Educativa, Cuenca, Ecuador.
12. Brady, C. (2011). La participación estudiantil en el Aula: Nuevas posibilidades Keynote presented at the XXIV Congreso Nacional de Enseñanza a las Matemáticas, the annual meeting of the Asociación Nacional de Profesores de Matemáticas (ANPM). Colima, MX.
13. Brady, C. (2011). Los significados de gráficos Cartesianos. Paper and two-day workshop presented at the *Seminario Nacional de Tecnología Computacional en la Enseñanza y el Aprendizaje de las Matemáticas*. Querétaro, MX
14. Brady, C. (2010). “Reflexiones acerca de la participación estudiantil.” Keynote presented at the Segundo Seminario Internacional sobre Resolución de Problemas y uso de la Tecnología Computacional, Saltillo, Coahuila, MX.

15. Brady, C. (2009). “Aprendizaje con base en la Participación Estudiantil” Keynote presented at the Primer Simposio Latinoamericano para la Integración de la Tecnología en el Aula de Matemáticas y Ciencias, Guadalajara, MX.
16. Brady, C. (2009). Comunidades de práctica. Paper and panel presented at the Primer Simposio Latinoamericano para la Integración de la Tecnología en el Aula de Matemáticas y Ciencias, Guadalajara, MX
17. Brady, C. (2009). Ambientes de simulación para la red TI-Navigator: NetLogo y SimCalc. Paper and workshop presented at the Primer Simposio Latinoamericano para la Integración de la Tecnología en el Aula de Matemáticas y Ciencias, Guadalajara, MX
18. Brady, C. (2008). Participación y evaluación formativa. Paper and two-day workshop presented at the *Seminario Nacional de Tecnología Computacional en la Enseñanza y el Aprendizaje de las Matemáticas*. Hermosillo, MX
19. Brady, C. (2006). “Corporate-research partnerships in the public interest” Invited paper, presented at the SIG EST/ATL Business Meeting, AERA Annual Meeting, San Francisco, CA.
20. Brady, C. (2003). “As we may learn, together” Invited paper, presented at the SIG EST/ATL Business Meeting, AERA Annual Meeting, Chicago, IL. (May, 2003).

GRANTS AND GOVERNMENT-FUNDED RESEARCH PROJECTS

Grant/Project Principal Investigator Role

- 2019-2022 NSF-DRK-12. Co-PI. **GEM-STEP \$1,557,238**. (with Joshua Danish, Indiana and Noel Enyedy, Vanderbilt).
- 2019-2020 Vanderbilt Trans-Institutional Partnerships (TIPS). Co-PI (Peabody Lead). **Computational Thinking and Learning Initiative \$150,000**. (with faculty from CS, Arts & Science, and the Libraries).
- 2017-2020 NSF-DRL-STEM+C. Co-PI. **Foreground and Background: Exploring the Integration of Mathematics and Computational Thinking \$1,249,250**. (with Melissa Gresalfi and Doug Clark, U Calgary).
- 2017-2020 NSF-DRL-STEM+C. Co-PI. **Science and Integrated Language Plus Computational Thinking and Modeling with English Learners (SAIL + CTM with ELs). \$2,498,849**. (with Okhee Lee, Lorena Llosa, NYU; Eric Klopfer, MIT and Doug Clark, U Calgary).
- 2017-2020 NSF-DRK-12. Co-PI. **Modeling Assessment to Enhance Teaching and Learning. \$2,023,815**. (with Rich Lehrer, Leona Schauble, and Mark Wilson, UC Berkeley)
- 2016-2018 NSF-ITEST, co-PI. **Group-Based Cloud Computing for STEM Education. \$580,488**. (with Walter Stroup, UMass Dartmouth, Tony Petrosino, UT Austin, and Uri Wilensky, Northwestern).

- 2016-2018 NSF-Cyberlearning, EAGER. PI. **NetStat: A representation and communication infrastructure for classroom collaboration in data modeling and statistics. \$296,877.** (with Tobin White, UC Davis).

Prior:

2017-2018. Peabody Internal grant. Co-PI, **The Making of Expansive Possibilities** (with Tesha Sengupta-Irving and Emily Phillips Galloway).

2016-2017 Vanderbilt Internal VIDL Macro Grant, co-PI. **CollabSNAP. \$9,980** (with Doug Clark).

2014-2018. NSF-Cyberlearning. PI. **Modeling in Levels: Supporting multi-level linked modeling in biology and social science. \$1,259,805.** Development and Implementation (DIP) Cyberlearning and Future Learning Technologies (with Uri Wilensky).

2014-2018. NSF-Cyberlearning & NSF-CE-21, EAGER. Co-PI. **A low-cost integrated agent-based modeling and physical computing platform. \$137,351.** Joint project under Cyberlearning and Future Learning Technologies (Cyberlearning) and Computing Education for the 21st Century (CE-21) (with Uri Wilensky).

2015-2016. Ministry of Education, Secretaría Nacional de Educación Superior, Ciencia y Tecnología, Ecuador. Co-PI and Investigador Extranjero. **La Modelación con apoyo de software libre, y los cambios en los procesos de aprendizaje en los estudiantes de primero de bachillerato.** (with Neli Norma Gonzales Prado, Universidad de Cuenca, Ecuador).

2012-2015. NSF-REESE. PI for research done at Inquire Learning. Co-PI. **Emerging Research-Empirical--Simulated Evolution: Developing a Framework for Computer-Based Modeling and Simulation Activities in the Classroom. \$995,180.** (with Uri Wilensky and Michael Horn).

2010-2014. NSF DRK12. PI for research done at Inquire Learning. Grant Senior Personnel. **Enabling Modeling and Simulation-based Science in the classroom: Integrating agent-based models, real world sensing and collaborative networks (ModelSim) \$2,095,316.** (with Uri Wilensky, David Figlio, Paulo Blikstein & Pratim Sengupta).

Grant/Project Individual Contributor Roles

2014-2016. NSF-CNS-CE21. **Computational Thinking in STEM: A Whole-School Model for Broadening Participation and Education in Computing.** Curriculum design and implementation for the CT4G (Computational Thinking for Girls) Girls' Clubs in South Chicago and Evanston.

2013-2014. Designer/Developer, **NetLogo 2.5D.** 3D Visualization Software to augment the NetLogo agent-based modeling (ABM) environment and dynamically visualize agent variables.

2013-2014. Designer/Developer, **ModelRuns**. Providing replay for the NetLogo ABM environment, allowing saveable, shareable, and annotatable model-runs.

2012-2014. Consultant, NSF-DRK12. **Enhancing Games with Assessment and Metacognitive Emphases (EGAME)** (PI Doug Clark, Vanderbilt, co-PIs Pratim Sengupta, Vanderbilt, Gautam Biswas, Vanderbilt, James Minstrell, Facet Innovations). Role: Software Design and Development, *SURGE Symbolic* (Disciplinarily-Integrated Game for Newtonian Physics)

2011-2015. Consultant, NSF-CAREER. **Computational Reconstruction of K-12 Science (CoRe-Science)** (PI Pratim Sengupta, Vanderbilt). Role: Software Design and Development, Constructionist graphing environment.

2007-2012. Consultant, Singapore MoE. **Generative Activities in Singapore** (GenSing) (PI Sarah Davis, Singapore National Institute of Education). Role: Software Design and Development, data collection and visualization software to identify patterns of collaboration in classroom network activities.

2009-2012. Consultant, NSF-CAREER. **Collaborative Learning with Classroom Networks: Integrating Technological and Pedagogical Innovations** (PI Tobin White, University of California, Davis). Role: Software Design and Development support, Development of NetLogo models, extensions, and handheld client software.

HONORS & AFFILIATIONS

Co Director Computational Thinking and Learning Initiative (Vanderbilt TIPs)	2019+
ISDDE Fellow International Society for Design and Development in Education	2019+
Secondary Appointment. Dept of Computer Science, College of Engineering, Vanderbilt.	2018+
CICATA, CDMX. Invited Address and Site Visit	2018 July
RELME 2016, Invited Keynote.	2016
IDC 2014 Best Short Paper. Frog Pond: A Code-First Learning Environment on Evolution and Natural Selection (coauthor)	2014
Invited Designer (as a principal of the MultiAgency Collective): The Museum of Modern Art (MoMA), NY, Cullman Education and Research Building Exhibit: The Exchange Archive, component of the Exchange Café. Installed May 24-June 30.	2013
Invited Instructor, Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Campus Madero, MX. <i>Modelando sistemas complejos con NetLogo</i>	2014

Invited Instructor, CADi, Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), Campus Monterrey, MX.	2012
Invited Instructor, University of Cuenca, Cuenca Ecuador	2011; 2015
5-day course, <i>Funciones, calculadoras gráficas y aplicación de software matemático (module for Masters in Teaching)</i>	2015
3-day course, <i>Modelación con NetLogo</i>	2011
Invited Keynote Speaker at various international conferences in Mexico and Ecuador	2009 - 2014
Invited Keynote, AERA SIG-EST/ATL annual meetings	2003, 2006
Presidential Scholarship Award, University of Virginia	1993
Teaching Commendation, University of Chicago	1992
College Fellow, University of Chicago	1991
Phi Beta Kappa, Junior Year Inductee	1989
Rufus Choate Scholar, Dartmouth College	1987 - 1990
Presidential Scholar, Dartmouth College	1987

TEACHING (UNIVERSITY-AFFILIATED)

Vanderbilt University, Nashville, TN	2016 - Present
<i>Courses:</i>	
SCED 3400/7400 Modeling and Complexity in Secondary Science	2020 Spring
MTED 3360/6380, Computers, Teaching & Mathematical Visualization	2019 Fall
MTED 3360/6380, Computers, Teaching & Mathematical Visualization (Co-Taught with Teresa Dunleavy)	2018 Fall
MTED 3360/6380, Computers, Teaching & Mathematical Visualization	2017 Fall
EDUC 7500, Mathematical Thinking & Learning in Reflective Practice	2017F-2018S
EDUC 3710/7500.03, Epistemological Foundations of Mathematics and the Sciences	2017 Spring
Independent Study, Epistemological Foundations of Mathematics (Isaac Nichols)	2017 Spring
MTED 3360/6380, Computers, Teaching & Mathematical Visualization	2016 Fall
Northwestern University, Evanston, IL	2014 - 2017

Courses:

MSED 451 Section 23, Foundations of Computational Thinking	2017 Summer
MSED 451 Section 27, Learning with Computational Modeling, 6-12	2017 Summer
ED351 Investigations of Mathematical Modeling & Quantification.	2014 Spring
SESP399 Statistics (independent study).	2014 Spring

University of Chicago, Chicago, IL 2013 - 2015

Young Scholars' Program (YSP)

Lead Instructor, 7th – 9th Grade Component

2013-14 Academic Year Sessions (Fall, Winter, Spring)

2014-15 Academic Year Sessions (Fall, Winter, Spring)

Girls' IBL Program Lead Instructor, 2015 (Initiated program 1/2015)

University of Virginia, Charlottesville, VA

Instructor, Carnegie Counterpoint Seminar

2003

(doubly-listed: English department and Curry School of Education)

Seminar instructor, Introduction to Literary Studies (3 courses)

1996 - 1998

Seminar instructor, Public Speaking (2 courses)

1995 - 1996

Piedmont Virginia Community College, Charlottesville, VA

1994 - 1996

Adjunct faculty member

Calculus instructor (Summer Semester Intensive Sessions)

University of Chicago, Chicago, IL

1993 - 1994

Teaching assistant, Honors Analysis (3-term course)

Prof. Raghavan Narasimhan

PHD STUDENT ADVISING

Lauren Vogelstein (co-Advisor with Rogers Hall).

(Began AY 2016-17)

Isaac Nichols (co-Advisor with Rogers Hall).

(Began AY 2017-18)

Jackson Reimers

(Began AY 2018-19)

Emma Grager Reimers (co-Advisor with Kevin Leander)

(Began AY 2018-19)

Ashlyn Pierson (with support of Doug Clark)

(Began Summer 2018)

SERVICE

PH. D. COMMITTEES

Stephanie Castillo, Vanderbilt

Santa Esmeralda Tejada Torres ITESM, Monterrey Campus, Mexico (external member)

Dissertation defense 11/2014.

Jason Hwang, University of California, Davis (external member)

Michael Stevens, University of California, Davis (external member)
Amy Voss Farris, Vanderbilt. Defended, 2019
Amanda Bell, Vanderbilt
Paul Johnson, Vanderbilt (Environmental Engineering, Vanderbilt)
Brian Broll, Vanderbilt (Computer Science), Vanderbilt. Defended 2018
Ashlyn Pierson, Vanderbilt. Defended 2020.
Isaac Nichols, Vanderbilt.
Alison Haas, New York University (external member). Defended, 2020.

PROFESSIONAL SERVICE & SERVICE TO THE FIELD, SINCE 2017

Reviewer for the Spencer Foundation

Expert consultant, concept of Function. For the Educational Testing Service, Southern Illinois University of Edwardsville and the Algebra Project, NSF-funded Concept of Function project (March 3, 4, 2017 and session during NCTM Research Pre-session, 2018).

Reviewer for the following research journals, publications, & conferences:

- IDC (2017)
- Intl Conference on Computational Thinking in Education CTE (2017)
- PME-NA (2017, 2018, 2019)
- Conference on Tangible, Embedded and Embodied Interactions, 2017 (TEI 2017)
- ICTMA (2018)
- Mathematical Thinking and Learning (MTL) x 4 (2017, 2018, 2019).
- ZDM (2018)
- Cognition & Instruction x3 (2018, 2019)
- JRME (2018)
- Journal of Engineering Education (2020)

Conference Program Committee / Planning Committee Member for the following conferences

- Psychology of Mathematics Education, North America (PME-NA), 2022
- Cyberlearning (twice)
- The International Conference on Computational Thinking in Education 2017 (CTE 2017).
- The 25th International Conference on Computers in Education (ICCE 2017)

Reviewer for the National Science Foundation. Served on review panels for the following NSF programs:

- CAREER (once, 2018)
- CISE (once, 2018)
- Cyberlearning (twice, 2017, 2018)
- ITEST (twice, 2017, 2019)
- AISL (twice, 2019, 2020)

Invited member OpenSciEd Design Team Participant , *Using Mathematics and Computational Thinking and Analyzing and Interpreting Data* design teams. (2018)

Associate Editor, *The Mathematics Enthusiast*. (2018+)

UNIVERSITY SERVICE

- Digital Projects and Services Committee (Office of the Provost; 2019-2020)
- Co-Director, Computational Thinking and Learning Initiative (2019+).
- CLAS summer awards and graduate admissions committee (Began February 2017).
- Research IT Special Project Working Group (under direction of Vice Provost for Research) (Began January 2017, ongoing). Including infrastructure planning and development, and flexible labor force initiatives (“programmer for hire” subcommittee)
 - Programmer for Hire concept and pilot (2017, 2018)
 - Research Software Engineer hiring committee (summer 2018)
 - Founding Member, Research IT Faculty Advisory Committee (fall 2018)
- Peabody Architectural Planning for Home Ec/Mayborn (HEM), with focus on basement (Makerspace, simulation labs, and science lab space). Began 2017.
- TIPs Discovery Awards Reviewer (2019)
- TIPs Discovery Awards Reviewer (Feb-Mar, 2018)
- TIPs Discovery Awards Reviewer (March, 2017)
- Committee to design a distance learning/High quality video conferencing room. (Sloop)
- FutureVU, MTA/RTA working group (began January 2017)
- International efforts coordinated by the Center for Latin American Studies (CLAS) (ongoing, began January 2017).
- VIEE, Vanderbilt Institute for Energy and the Environment.

DEPARTMENTAL SERVICE

- 2019-2020: Area Chair, Learning and Design.
- 2018: Worked with Chris Vanags to do groundwork on discussions for VU-MNPS partnership on district-articulated research goals and questions.
- LDUS recruiting and post-admissions advice (2018)
- 2017-18: Worked with Vice-Provost’s office and IRB to establish procedures for permitting RedCap Electronic Consent forms in research. This has been used in two DTL projects to date.
- Search Committee Member, Learning Sciences (began September 2017)
- Initiated *Math Club* (January 2017), for mathematically-inclined DTL students to engage in shared inquiry; weekly meetings.

COMMUNITY & OUTREACH

- VandyHacks VI. Judge for Hackathon (11/1-3/2019).
- VISOR, Vanderbilt Institute for Smart Cities Operation and Research
- Instructional and planning support, Math and Science Departments, West End Middle Prep (2018-2020).

- School Improvement Committee, West End Middle Prep (2018-2020)
- STEAM night, Computational Thinking Club for Isaac Litton Middle Prep (2018).
- Instructional and planning support, 7th and 8th grade math team, Donelson Middle (2018-19).
- Planning and implementation support for Warner Elementary, Arts and STEM magnet.
- Invited talk at the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM), “Problematizar y (Re-)Formular: ¿Cómo incluir estos ‘verbos’ en la experiencia estudiantil?” (November, 2016).
- Faculty Brown Bag presentation, Center for Latin American Studies (CLAS) (November, 2016)
- Prior Service Note: Workshops. Over the past ten years, I have led approximately 70 teacher workshops in Latin America, ranging from 3 hours to 5 days in duration, delivered in Spanish, and focused on the use of dynamic mathematics software in collaborative classroom networks to support fundamental changes in pedagogy and classroom culture. These workshops have been in support of implementation projects ranging from school level to the state level. They have occurred in Ecuador, Chile, and Mexico, with the preponderance in Mexico in the states of Nuevo Leon, Chihuahua, Coahuila, Tamaulipas, Veracruz, Jalisco, Michoacán, and the Distrito Federal. In the United States and Singapore, I have led approximately 10 workshops of a similar nature, in English.