

# CHRISTOPHER PROCTOR

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## Education

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Stanford University	<b>PhD in Education</b> (2020) Learning Sciences & Technology Design Dissertation: <i>Supporting Critical Computational Literacies Through Interactive Storytelling</i> Paulo Blikstein, Brigid Barron, Antero Garcia & Roy Pea
	<b>MS in Computer Science</b> (2019) Artificial Intelligence & Human-Computer Interaction
	<b>MA in Education</b> (2007) Teaching Secondary English
	<b>BS in Symbolic Systems</b> (2006) Decision-Making & Rationality
	<b>BA in English</b> (2006) Critical Theory & Early Modern Period

## Professional appointments

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2020- Assistant Professor of Learning Sciences, University at Buffalo, SUNY  
Program director, Computer Science teacher preparation  
Affiliate faculty, Department of Engineering Education  
Affiliate faculty, Department of Computer Science and Engineering

## Journal articles (peer reviewed)

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- Proctor, C.** (in press). Computational thinking. In *International Encyclopedia of Education*. Elsevier. [Invited submission].
- Kafai, Y.B., **Proctor, C.** (2021). A Revaluation of Computational Thinking in K-12 Education: Moving Towards Computational Literacies. *Educational Researcher*.
- Kafai, Y.B., **Proctor, C.**, & Lui, D. (2020) From theory bias to theory dialogue: Embracing cognitive, situated and critical framings of computational thinking for K-12 CS education. *ACM Inroads*, 11(1), 44-53. <https://doi.org/10.1145/3381887>. (Invited republication.)
- Proctor, C.** & Blikstein, P. (2019). Unfold Studio: Supporting critical literacies of text & code. *Information and Learning Science*, 120(5/6). pp. 285-307. <https://doi-org.gate.lib.buffalo.edu/10.1108/ILS-05-2018-0039>.

## Books (peer reviewed)

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Blikstein, P., Bumbacher, E., Davis, R., **Proctor, C.**, & Lin, V. (Forthcoming). *Learning-Centered Design: Methodologies for the Design of Learning Technologies and Environments*. Cambridge, USA: MIT Press.

## Edited Volumes (peer reviewed)

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Vogel, S., Suárez, E., Semel, B., & **Proctor, C.** (Eds.) (Forthcoming). *Learning machines, humans learning: Critical perspectives on languaging in digitally-mediated environments*. Contributions to the

Sociology of Language Series, de Gruyter Mouton.

## Book chapters (peer reviewed)

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- Burke, Q., O'Donnell, K., Angevine, C., & **Proctor, C.** (2022). Credentialing computation: Empowering teachers in computational thinking through educator microcredentials. In C. Mouza, A. Yadav, & A. Leftwich (Eds.), *Professional Development for In-Service Teachers: Research and Practices in Computing Education*. Information Age Publishing. (pp. 341-360).
- Proctor, C.** & Garcia, A. (2020). Student voices in the digital hubbub. In L. Hogg, K. Stockbridge, C. Achieng-Evensen, & K. Stockbridge (Eds.), *Pedagogies of With-ness: Students, teachers, voice and agency*. Myers Education Press. (pp. 119-132).

## Full conference papers (ACM & ISLS)

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- Proctor, C.** & Muller, D. (2022). Joint visual attention and collaboration in Minecraft. In A. Weinberger, W. Chen, D. Hernández-Leo, & B. Chen (Eds.). (2022). *Proceedings of the 15th International Conference on Computer-Supported Collaborative Learning - CSCL 2022*. (pp. 226-233). Hiroshima, Japan: International Society of the Learning Sciences. (46% accepted.)
- Proctor, C.**, Zheng, Y., & Blikstein, P. (2020). Comparing Cognitive and Sociocultural Assessments of Learning in Middle School Computer Science. In M. Gresalfi & I.S. Horn (Eds.). *The Interdisciplinarity of the Learning Sciences, 14th International Conference of the Learning Sciences (ICLS) 2020*. (pp. 238-245). Nashville: International Society of the Learning Sciences. (38% accepted.)
- Kafai, Y., **Proctor, C.**, & Lui, D. (2019). From theory bias to theory dialogue: Embracing cognitive, situated and critical framings of computational thinking for K-12 CS education. In R. McCartney et al. (Eds.) *Proceedings of the 2019 ACM Conference on International Computing Education Research*. (pp. 101-109) New York: ACM. (20% accepted.) **Chair's award.**
- Proctor, C.** (2019). Measuring the computational in computational participation: Debugging interactive stories in middle school computer science. In K. Lund et al. (Eds.). *A Wide Lens: Combining Embodied, Enactive, Extended, and Embedded Learning in Collaborative Settings, 13th International Conference on Computer Supported Collaborative Learning (CSCL) 2019*. (pp. 104-111). Lyon, France: ISLS. (31% accepted.)
- Proctor, C.**, Bigman, M., & Blikstein, P. (2019). Defining and designing computer science education in a k-12 public school district. In E. Hawthorne & M. Pérez-Quiñones (Eds.) *Proceedings of the 50th ACM Technical Symposium on Computer Science Education (SIGCSE '19)*. (pp. 314-320). New York: ACM. (32% accepted.)
- Proctor, C.**, & Blikstein, P. (2018). How broad is computational thinking? A longitudinal study of practices shaping computer science learning. In J. Kay & R. Luckin (Eds.). *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018*. (pp. 544-551). London, UK: ISLS. (32% accepted.)
- Davis, R., **Proctor, C.**, Friend, M., & Blikstein, P. (2018). Solder and wire or needle and thread: do the tools we use change the way we think? In J. Kay & R. Luckin (Eds.). *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018*. (pp. 800-807). London, UK: ISLS. (32% accepted.)

## Conference proceedings (peer reviewed)

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- Proctor, C.** (2023). Assessing computational texts through rhetorical analysis to center student identity and voice. In Yadav, A.. (Organizer) *Computational Thinking in Humanities*. Structured poster session to be presented at American Educational Research Association Annual Meeting.

- Proctor, C.** (2023). Community-based design of a CS teacher preparation program. In Strawhacker, A., Hassenfeld, Z., & Walker, J. (Organizers) *Practice and Positionality: Critical Instantiations of STEAM Education and Research* Symposium to be presented at American Educational Research Association Annual Meeting.
- Wang, X. C. & **Proctor, C.** (2022). *Computational Thinking (CT) Meets Young Children: Critical Review of Research on CT in Early Childhood*. American Educational Research Association Annual Meeting, San Diego, USA.
- Proctor, C.** (2021). Identity as interface. In M. Shaw & Kafai, Y.B. (Organizers) *Humanizing Computer Science Education*. Structured poster session at American Educational Research Association Annual Meeting.
- Proctor, C.** (2021). Laughing at social media. In Flores, N. & Rosa, J. (Discussants) *The Linguistic Hierarchies Embedded in Digital Tools: Exploring the Intersections of Language, Technology & Power*. Colloquium conducted at the meeting of the American Association of Applied Linguistics.
- Proctor, C.,** Han, J., Wolf, J., Ng, K., & Blikstein, P. (2020) Recovering Constructionism in Computer Science: Design of a Ninth-grade Introductory Computer Science Course. In B. Tangney, J. Rowan Byrne, & C. Girvan (Eds.) *Proceedings of the 2020 Constructionism Conference*. (pp. 473-481). Dublin, Ireland: University of Dublin.
- Proctor, C.** (2020). *Literacy-based CS: Supporting identity, voice, and a sense of place through interactive storytelling*. [Paper presentation]. Computer Science Teachers Association Northeast (CSTA-NE).
- Proctor, C.** (2020). *Interactive storytelling: Weaving together literacies of text and code*. [Workshop]. Computer Science Teachers Association (CSTA).
- Burke, Q., Angevine, C., & **Proctor, C.** (2020). Credentialing Computation: Teacher Micro-credentials in Computational Thinking. Paper to be presented at American Educational Research Association annual conference, April 2020, San Francisco, USA. (Conference cancelled).
- Proctor, C.,** & Garcia, A. (2020). "True love or the guy that was there": Supporting Identity and Voice in Computational Literacies. In Shaw, M., & Kafai, Y. (Organizers). *Dis/Connecting with Computing: Designing for Critical Identities and Equitable Inquiry in K-12 CS Education*. Symposium to be held at American Educational Research Association annual conference, April 2020, San Francisco, USA. (Conference cancelled).
- Kafai, Y., **Proctor, C.,** Lui, D. (2019). Framing Computational Thinking for Computational Literacies in K-12 Education. In *Proceedings of the 2nd Weizenbaum Conference*. Berlin, Germany.
- Proctor, C.** (2019). Considering theory in the design of CS education infrastructure: Three framings of computational thinking. In Brusilovsky, P, T.W. Price, L. Malmi and S. Edwards. *Proceedings of SPLICE 2019 workshop Computing Science Education Infrastructure: From Tools to Data* at 15th ACM International Computing Education Research Conference, Aug 11, 2019, Toronto, Canada. (Invited submission).
- Proctor, C.** & Rogers, C. (2019). *Interactive Storytelling with Unfold Studio*. [Workshop]. Iowa Technology and Education Conference (ITEC), Des Moines, Iowa.
- Proctor, C.** & Rogers, C. (2019). *Stories Told and Lessons Learned: Literacy-based Computer Science at an Iowa Middle School*. [Paper presentation]. Iowa Technology and Education Conference (ITEC), Des Moines, Iowa.
- Boles, K., Macedo, L., **Proctor, C.,** & Blikstein, P. (2018). Manipul8: An Interactive Experience to Inspire Pattern-Based Algebraic Thinking and Representational Fluency. Demo presented at Interaction

Design & Children (IDC), Trondheim, Norway.

Mongkhonvanit, K., Zau, C., **Proctor, C.**, & Blikstein, P. (2018). Testudinata: A Tangible Interface for Exploring Functional Programming. Demo presented at Interaction Design & Children (IDC), Trondheim, Norway.

**Proctor, C.** (2018). *Interactive Storytelling*. [Workshop]. Computer Science Teachers Association (CSTA), Omaha, NE.

**Proctor, C.** (2018). *Interactive Storytelling: Weaving Together Literacies of Text and Code*. [Paper presentation]. Philadelphia Writing Project Celebration of Writing & Literacy, Philadelphia, PA.

**Proctor, C.**, & Blikstein, P. (2017). *Interactive Fiction: Weaving together literacies of text and code*. Work-in-progress paper presented at Interaction Design and Children (IDC), Stanford, CA.

**Proctor, C.** & Garcia, A. (2017). *Worldbuilding for Safe, Secure, and Private Futures: Producing Internet-Related Roleplaying Games and Interactive Fiction*. [Workshop]. MozFest. London, UK.

**Proctor, C.** & Blikstein, P. (2016). Grounding how we teach programming in why we teach programming. (pp. 127-134). In A. Sipitakiat & N. Tutiya-phuengprasert (Eds.) *Constructionism in Action: Proceedings of Constructionism 2016*.

## Grants

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- 2022 **\$277,000** *Designing a residency-based CS teacher preparation program with a high school community*. NSF CS for All RPP.
- 2019 **\$10,000** *Scaling ProgSnap2 for wider adoption*. SPLICE, NSF-funded workshop.
- 2019 **\$8,000** *Scaling up Unfold Studio: Computational literacy beyond Silicon Valley*. TELOS initiative, Stanford University.
- 2017 **\$4,250** *The linguistic production of learning opportunities*. Lopatin Fellowship, Stanford University.
- 2016 **\$17,000** *The contextual future of situated schools*. MediaX, Stanford University.
- 2016 **\$7,500** *Interactive fiction: Weaving together literacies of text and code*. TELOS initiative, Stanford University.

## Honors & Awards

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- 2019 L. Ramon Veal Research Seminar, National Council of Teachers of English
- 2017 Honorable Mention, National Science Foundation Graduate Research Fellowship

## University teaching experience

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- 2022 **Instructor**, University at Buffalo (SUNY), Qualitative Research Design.
- 2022 **Instructor**, University at Buffalo (SUNY), Critical Computational Literacies (new course).
- '21-'22 **Instructor**, University at Buffalo (SUNY), Doctoral proseminar.
- 2021 **Instructor**, University at Buffalo (SUNY), Critical Computational Literacies Design Studio (new course).
- 2019 **TA**, Stanford University, The Centrality of Literacies in Teaching & Learning.
- 2019 **Instructor**, Teachers College, Columbia University, Beyond Bits and Atoms: Designing Technical Tools.
- 2019 **Instructor**, Teachers College, Columbia University, Beyond Bits and Atoms Lab.
- 2018 **Instructor**, Stanford University, Beyond Bits and Atoms: Designing Technical Tools.
- 2018 **TA**, Stanford University, The Centrality of Literacies in Teaching & Learning.
- 2017 **TA**, Stanford University, Beyond Bits and Atoms: Designing Technical Tools.
- 2017 **TA**, Stanford University, The Centrality of Literacies in Teaching & Learning.

## K12 teaching experience

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Certifications: National Board (2012), Texas English (2009), California English & Math (2007, 2009)

- '14-'16 **Computer Science Teacher** at Creekside Learning Lab, Woodside, CA
- '13-'15 **Computer Science Teacher** at The Girls' Middle School, Palo Alto, CA
- 2010 **Teaching Shakespeare Institute**, Folger Shakespeare Library, Washington, DC
- '09-'11 **English Teacher** at Westlake High School, Austin, TX
- '07-'09 **English Teacher** at Palo Alto Senior High School, Palo Alto, CA

## Software development experience

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Full-stack developer with specialty in user research, UI, UX, machine learning, scientific computing. Expert in Python, Javascript, web technologies. Proficient in C, C++, Java, Swift, R.

- 2019 **Designer and developer** QC: Qualitative coding for computer scientists. (<https://pypi.org/project/qualitative-coding/>)
- '17-'19 **Research software developer** for PeerTeach, Palo Alto, CA  
Designed, developed, and deployed interactive web application for helping students become more effective peer tutors.
- 2016- **Designer and developer** of Unfold Studio (<https://unfold.studio>)  
Web application for interactive storytelling and literacy-based CS education. Deployed at 6 schools; 10k student stories submitted. (<https://unfold.studio>)
- '12-'13 **Lead developer** at cK-12 Foundation, Palo Alto, CA  
As leader of cK-12's Interactive Learning Group, wrote interactive learning design framework and managed a team of 8 developing interactive algebra and geometry curricula. Designed architecture to serve over 500k interactive simulations; analyzed student interactions to assess learning.

## Invited talks

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- 2022 *Literacy-based CS pedagogy with Unfold Studio: Interactive Storytelling.* Anchor speaker, CSTA Midwest is Best Unconference.
- 2022 *CS Across the Curriculum: Not one more thing.* CSTA CS Across Curriculum Summit.
- 2021 *Computational literacy and multilingual learners.* AERA Educational Research Conference on Computer Science for Multilingual Students.
- 2021 *Making with AI.* Professional development workshop, Darunsikkhalai School, Bangkok, Thailand.
- 2021 *Designing Unfold Studio.* Invited course speaker, Learning Sciences: Past, Present, and Future. University of Pennsylvania.
- 2021 *Assessment for learning in K-12 Computer Science.* UpBeat speaker series, Department of Computer Science and Engineering, University at Buffalo, SUNY.
- 2020 *Measuring the Computational in Computational Participation.* Invited course speaker, Education Technology and the Learning Sciences, Teachers College, Columbia University.
- 2019 *Connecting Computational Thinking to Broader Literacies* TELOS festival, Stanford University.
- 2018 *Interdisciplinary computational thinking.* Invited course speaker, Computer Science Curriculum & Instruction, Stanford University.
- 2016 *Student journalism and mobile media.* Norcal Media Day, Journalism Education Association of Northern California, Palo Alto, CA.

## Academic community

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- 2022 **Panel Reviewer** for NSF Discovery Research PreK-12.
- 2022 **Reviewer** for *Early Childhood Research Quarterly*.
- 2021 **Reviewer** for *Journal of the Learning Sciences, Computers and Education*, International Society of the Learning Sciences Annual Meeting.
- 2021 **Critic**, Situated Technologies technical methods course, UB School of Architecture and Planning.
- '20-'21 **Invited participant** *Piecing Together the Next 15 Years of Computing Education Research*. NSF Workshop. (Grant #2039833 & #2039848).
- 2021 **Invited participant** *Integrated computational thinking delphi study*. (NSF grant #1933933).
- 2020 **Proceedings Chair** Fablearn 2020.
- 2020 **Reviewer** for *Computers in Education, International Conference of the Learning Sciences, Information and Learning Science, ACM SIGCSE*; SIGCSE Program Committee.
- 2019 **Reviewer** for *ACM SIGCSE*; SIGCSE Program Committee.
- 2019 Building a Participatory Classroom Culture Through Gaming. (In press.) NCTE Quick Reference Guide written with Antero Garcia.
- 2018 **Reviewer** International Conference of the Learning Sciences (ICLS), FabLearn 2019
- 2017 **Conference volunteer** Interaction Design & Children (IDC) 2017, Stanford, CA; FabLearn 2017, Stanford, CA
- '16-'17 **Professional development leader** Darunsikkhalai School, Bangkok, Thailand  
Planned and led two four-day workshops for 35 teachers on constructionist pedagogy, with a focus on powerful ideas, assessment, and shaping learning environments.
- 2016 **Conference volunteer** FabLearn 2016, Stanford, CA
- 2015 **Professional development leader** Merced County Office of Education, California  
Planned and led a two-day workshop for 20 teachers on using Arduino in STEM high school courses.

*Revised November 2022*