

Quentin Bidy

Research Associate

Institute of Cognitive Science (ICS)

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Professional Preparation

Oklahoma State University	Applied Science	A.A.S. 1999
University of Oklahoma	Science Education	B.S. 2006
University of Oklahoma	Science Education	M.Ed. 2014
University of Oklahoma	Science Education	Ph.D. 2018

Appointments

- 2021 – Present Assistant Research Professor and Science Education Specialist, University of Colorado
- 2018 – 2021 Research Associate and Science Education Specialist, University of Colorado
- 2016 – 2018 Project Director Central Oklahoma Rural Partnership for Science: Mathematics and Science Partnership, University of Oklahoma
- 2015 – 2018 Adjunct Professor - Science Education Teaching Methods, Jeannine Rainbolt College of Education, University of Oklahoma
- 2014 – 2016 Project Manager, Phase I & II Oklahoma Academic Standards for Science Frameworks Project, Oklahoma State Department of Education
- 2014 – 2016 Secondary Science Curriculum Content Specialist/Coordinator, K20 Center, University of Oklahoma
- 2012 – 2014 Research Associate/Secondary Science Curriculum Content Specialist, K20 Center, University of Oklahoma
- 2006 – 2012 Middle school science teacher, Highland West Junior High, Moore, OK

Refereed Articles and Book Chapters

Chakarov, A., Bidy, Q., Hennessy Elliott, C., Recker, M. (accepted). The Data Sensor Hub (DaSH): A Physical Computing System to Support Middle School Inquiry Science Instruction. Paper submitted to *Sensors*.

Bidy, Q. Gendreau, A., Bush, J.B., Hennessy Elliot, C. Jacobs, J., Recker, M., Sumner, T., & Penuel, W. (2021). A professional development model to integrate computational thinking into middle school science through co-designed storylines. *Contemporary Issues in Technology and Teacher Education*, 21(1).

<https://citejournal.org/volume-21/issue-1-21/science/a-professional-development-model-to-integrate-computational-thinking-into-middle-school-science-through-codesigned-storylines>

Chakarov, A., Bidy, Q., Jacobs, J., Penuel, W., Recker, M., & Sumner, T., (In press). Professional development supporting middle school teachers to integrate computational thinking into their science classes. In Mouza, C., Yadav, A., & Leftwich, A. (Eds.). *Preparing Teachers to Teach Computer Science: Models, Practices and Policies*. Charlotte, NC: Information Age Publishing.

Biddy, Q. (2015). A Cool Controversy: Exploring the nature of science using a historical debate about glaciers. *The Science Teacher: History and Nature of Science*, 82(7), 52.

Refereed Conference Proceedings and Publications

Biddy, Q., Bhaduri, S., Bush, J.B., Hennessy Elliott, C., Recker, M., and Sumner, T. (accepted). Co-designing Opportunities for Rural Middle School youth to Engage with STEM Careers and Career Pathways. Paper to appear at the *AERA International Conference 2022: Cultivating Equitable Education Systems for the 21st Century*. San Diego, CA: AERA

Gendreau Chakarov, A., Bush, J.B., Biddy, Q., Jacobs, J., Sumner, T., Hennessy Elliott, C., and Recker, M. (accepted). DaSH Home: Using Programmable Sensors to Support Student Driven Investigations During Remote Learning. Paper to appear at the *AERA International Conference 2022: Cultivating Equitable Education Systems for the 21st Century*. San Diego, CA: AERA

Gendreau Chakarov, A., Bush, J., Biddy, Q., Jacobs, J., Hennessy Elliott, C., & Sumner, T. (2021). Challenges and Unexpected Affordances of Physical Computing Going Remote. Paper to appear at the *2021 Interaction Design and Children Conference*.

Gendreau Chakarov, A., Biddy, Q., Jacobs, J., Recker, M., Sumner, T., Bush, J. B. & Hennessy Elliott, C. (2021). Supporting teachers to implement engineering design challenges using sensor technologies in a remote classroom environment. Paper submitted to the annual meeting of the *American Society for Engineering Education*.

Hennessy Elliott, C., Gendreau Chakarov, A., Biddy, Q., Bush, J. B., Jacobs, J. & Recker, M. (2021). Teacher learning as co-operative work to expand images of future classrooms. Paper submitted to the annual meeting of the *International Society of the Learning Sciences*.

Bhaduri, S., Biddy, Q., Bush, J. B., and Sumner, T. (2021). 3DnST: A Framework Towards Understanding Children's Interaction with Tinkercad and Enhancing Spatial Thinking Skills. Paper submitted to the ACM conference on *Interaction Design and Children*.

Bhaduri, S., Biddy, Q., Rummel, M., Bush, J., Jacobs, J., Recker, M., Ristvey Jr, J. D., Chakarov, A. G., Elliott, C. H., & Sumner, T. (2021). Integrating Professional Mentorship with a 3D Printing Curriculum to Help Rural Youth Forge STEM Career Connections. Accepted for 2021 *ASEE Annual Conference & Exposition*. ASEE Conferences, Long Beach, California.

Gendreau Chakarov, A., Biddy, Q., Jacobs, J., Recker, M., & Sumner, T. (2020). Opening the Black Box: Investigating Student Understanding of Data Displays Using Programmable Sensor Technology. In *Proceedings of the 2020 ACM Conference on International Computing Education Research* (pp. 291-301).

Biddy, Q., Chakarov, A., Jacobs, J., Sumner, T., Recker, M., Penuel, W., (2020). Integrating Computational Thinking into Middle School Science through Co-designed Storylines. Research Presentation at ASTE International Conference: *Perfecting Your Vision for Teacher Training*. San Antonio, TX: ASTE.

Chakarov, A., Bidy, Q., Runberg, D. (2020). Using Sensor Technologies to Introduce Secondary Education Students to Computational Thinking and Computer Science. Research Presentation at SIGCE Technical Symposium: *A Vision for the Next 50 Years*. Portland, OR: SIGSCE.

Bidy, Q, Penuel, W., Henson, K, Wingert, K., (2020). From Three to Five Dimensions: Design Heuristics for Science Assessments that Elicit Interest and Identity. Research Presentation at ICLS: *The Interdisciplinarity of the Learning Sciences*. Nashville, TN: ICLS.

Furtak, E., Kang, H., Pellegrino, J., Harris, C., Krajcik, J., Morrison, D., Bell, P., Lakhani, H., Suárez, E., Buell, J., Nation, J., Henson, K., Fine, C., Tschida, P., Fay, L., Bidy, Q., Penuel, W. & Wingert, K. (2020). Emergent design heuristics for three-dimensional classroom assessments that promote equity. Research Presentation at ICLS: *The Interdisciplinarity of the Learning Sciences*. Nashville, TN: ICLS.

Sumner, T., Recker, M., Penuel, W., Gendreau Chakarov, A., Bidy, Q., Jacobs, J., Hervey, S., Olezene, S., Landsman, S., & Franco, D. (2019). Supporting the integration of computational thinking into middle school science through curriculum and professional development. Poster Presentation at *NSF STEM+C Co-PI meeting*. Alexandria, VA: NSF

Sumner, T., Penuel, W., Gendreau Chakarov, A., Jacobs, J., Bidy, Q., & Recker, M. (2019). Evidence sharing: designing middle school science storylines integrating sensor technologies and data-driven science in the context of a research-practice partnership. Research Presentation at *Middle School session at NSF STEM+C Co-PI meeting*. Alexandria, VA:

Recker, M., Sumner, T., Penuel, W., Gendreau Chakarov, A., Jacobs, J., & Bidy, Q. (2019). Evidence sharing: Designing middle school science storylines integrating sensor technologies and data-driven science. Research Presentation at *Data session at NSF STEM+C Co-PI meeting*. Alexandria, VA: NSF

Chakarov, A., Bidy, Q., Recker, M., Jacobs, J., Sumner, T., Hervey, S., Van Horne, K., & Penuel, W. (2019) Designing and implementing sensor-based science units that incorporate computational thinking. Research Presentation at AERA International Conference 2019: *Leveraging Education Research in a Post Truth Era: Multimodal Narratives to Democratize Evidence*. Toronto, Canada: AERA.

Bidy, Q. L., & Laubach, T. A. (2018). Understanding Pedagogical Content Knowledge in a Three-Dimensional Learning Context. Publication in NARST 2018 International Conference Proceedings: *Re-Centering on Scientific Literacy in an Era of Science Mistrust and Misunderstanding*. Atlanta, GA: NARST.

Bidy, Q. L., & Laubach, T. A. (2015). Understanding the Nature of Science Through Integrating the History of Science. In M. J. Mohr-Schroeder, & S. S. Harkness (Eds.), Proceedings of the 114th Annual Convention of the School Science and Mathematics Association (Vol. 2). Oklahoma City, OK: SSMA.

Other Publications and Products

Vu, M., Bush, J.B., Bidy, Q., (2021). Sensor Immersion: Engaging Students in Computational Thinking. Presentation at Micro:Bit Live 2021. Virtual Conference

Biddy, Q., Rummel, M., Ristvey, J. (2021). Making Connections to Careers in Your STEM Classroom. *Broadening the Pathways to Science*. Virtual Conference: CO

Biddy, Q., Slater, J., (2017). Learning and assessment: A phenomenal pairing (3D assessments for the next generation). Presentation at K20 Innovative Learning Institute: *Maximizing Potential: Leaders, Teachers, Students, Communities*. Norman, OK: K20ILI

Biddy, Q., Slater, J., (2017). Central Oklahoma Rural Partnership for Science: Three Dimensional Phenomena Driven Assessment. Presentation at K20 Innovative Learning Institute: *Maximizing Potential: Leaders, Teachers, Students, Communities*. Norman, OK: K20ILI

Oklahoma State Department of Education (2015). Oklahoma Academic Standards Science Frameworks Project. Oklahoma City, OK. Authors

Oklahoma State Department of Education (2014). Oklahoma Academic Standards for Science. Oklahoma City, OK. Authors.

Current Research Support

[Developing a model of teacher learning to support computationally rich communication in science classroom](#)

Principal Investigator: Tamara Sumner; Co-Principal Investigator: William Penuel; Co-Principal Investigator: Jennifer Jacobs; Co-Principal Investigator: Quentin Biddy; Co-Principal Investigator: Mimi Recker; Co-Principal Investigator: Stephanie Hervey; Co-Principal Investigator: Stacie Gomm; Organization: University of Colorado at Boulder; Organization: James S. McDonnell Foundation; Award Amount: \$2,500,000

[Collaborative Research: DTI: STEM Career Connections:](#)

[A model for preparing economically-disadvantaged rural youth for the future workforce](#)

Award Number: 1948709; Principal Investigator: Tamara Sumner; Co-Principal Investigator: Quentin Biddy; Organization: University of Colorado at Boulder; NSF Organization: ITEST; Start Date: 4/1/2020; Award Amount: \$599,660

[Collaborative Research: SchoolWide Labs: Using a School-Based Sensing Platform and Targeted Teacher Professional Development to Support Computational Thinking Integration and Student Learning](#)

Award Number: 1742053 & 1742046; Principal Investigator: Tamara Sumner; Co-Principal Investigator: William Penuel; Co-Principal Investigator: Jennifer Jacobs; Co-Principal Investigator: Susan Olezene; Co-Principal Investigator: Jahnell Pereira; Organization: University of Colorado at Boulder; NSF Organization: STEM + Computing; Start Date: 9/1/2017; Award Amount: \$2,123,801

[AI Institute: Institute for Student-AI Teaming](#)

Award Number: 2019805; Primary Investigator: Sidney D'Mello; Co-Principal Investigator: Martha Palmer; Co-Principal Investigator: J. Ross Beveridge; Co-Principal Investigator: Tamara Sumner; Co-Principal Investigator: Sadhana Puntambekar; Organization: University of Colorado at Boulder; NSF Organization: AI Research Institutes; Award Amount: \$19,993,294

[Examining an Innovative Approach to Supporting Science Teachers Practice towards Three-Dimensional Learning Goals through Adapting Classroom Assessment Tasks](#) Award Number: 2010086; Principal Investigator: William Penuel; Co-Principal Investigator: Christopher Wilson; Co-Principal Investigator: Molly Stuhlsatz; Organization: University of Colorado at Boulder; NSF Organization: Discovery Research K-12; Award Amount: \$1,317,006

Completed Research Support

[Central Oklahoma Rural Partnership for Science](#)

Principal Investigator: Linda Atkinson; Co-Principal Investigator: Quentin Biddy; Co-Principal Investigator: Janis Slater; Organization: University of Oklahoma; Funding Organization: U.S. Department of Education: Mathematics and Science Partnerships; Award Amount: \$1,200,000

Education

Co-authored 14 publications with graduate students.

Mentoring graduate students in the Computer Science Department with the Institute of Cognitive Science through regular lab group meetings consisting of 8-10 graduate students at various stages of progress in their graduate trajectory. Mentoring of individual students during the data collection, analysis, writing phases of their dissertations, and revising dissemination publication efforts. .

Provided focused mentoring with two graduate students Alex Geandreau Chakarov and Srinjita Bhaduri.

CU Service

Serving on the University of Colorado Institute of Cognitive Science Executive Committee starting Fall 2020.

Professional Service

Serving as a reviewer in the peer reviewed journals *Teacher and Education*.

Served as Project Director for Mathematics and Science Partnership grant, Central Oklahoma Rural Partnership for Science. CORPS created a research-practice partnership involving ~70 science teachers serving ~3600 students (grades 3-12), The goal was to increase teacher capacity to create and implement research-based 3D instructional tasks, strategies, and diagnostic assessments aligned to *A Framework for K-12 Science Education* (NRC, 2012).

Served as project manager for the Oklahoma Academic Standards for Science Frameworks Project Phase I & II managing 20 teacher framework writers and editing/developing 3D integrated teacher resources aligned with *A Framework for K-12 Science Education* (NRC, 2012).

Served as an instructional coach to 25 OKC urban secondary science educators assisting them in transitioning to 3D phenomenon-based teaching and learning as outlined by *A Framework for K-12 Science Education* (NRC, 2012).

Consulted for the Oklahoma National Memorial and Museum as curriculum/game designer of three interactive STEM learning experiences, integrating STEM concepts into the history of the OKC bombing in a highly interactive digital environment to stimulate learning that connects the past with the future.

K-12 Outreach

Through a research-practice partnership established in 2007 between the University of Colorado Boulder and Denver Public Schools. This work has expanded into new partnerships with Eagle County Public School and afterschool programs and the St. Vrain Valley School District.

Schoolwide Labs works to develop theory, professional learning processes and tools to support teachers in the equitable integration of computational thinking into NGSS aligned middle school science and afterschool STEM programs using a sensing platform and 3D modeling and printing through co-designed storylines and to deepen students' interest and engagement in computational thinking through teacher professional learning, research, and partnership development.