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**Boulder, CO 80305**  
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## **EDUCATION**

- 1993-1996                    **PhD in Developmental Psychology**  
Clark University  
Dissertation: *Communicative Processes in Cultural Identity Formation: A Mediated Action Account*  
Chair: James V. Wertsch  
Committee Members: James Paul Gee, Nancy Budwig
- 1991-1992                    **EdM in Counseling Processes**  
Harvard Graduate School of Education  
Master's Project: *An Ethnographic Evaluation of an HIV/AIDS Prevention Program*  
Advisor: Robert L. Selman
- 1988-1991                    **BA in Psychology**  
Clark University  
Bachelor's Thesis: *Animals as Objects of Moral Concern: A Narrative Approach*  
Advisor: Bernard Kaplan

## **HONORS AND AWARDS**

Outstanding Reviewer, *American Educational Research Journal* (2022)  
Distinguished Professor, University of Colorado Boulder Regents (2020)  
Outstanding Postdoc Mentor Award, University of Colorado Boulder (2020)  
Elected Member, National Academy of Education (2019)  
Fellow, International Society of the Learning Sciences (2019)  
Fellow, International Society for Design and Development in Education (2015)  
AERA Fellow (2014)  
Jacob Hiatt Fellow in Psychology (1994-95)  
Phi Beta Kappa (1991)  
Graduated Summa Cum Laude from Clark University (1991)  
Outstanding Undergraduate in Psychology (1991)

## **POSITIONS HELD**

- 2020-present                    **Distinguished Professor of Learning Sciences and Human Development**  
Institute of Cognitive Science and School of Education  
University of Colorado-Boulder

## **POSITIONS HELD (Cont'd)**

2011-2020	<b>Professor of Learning Sciences and Human Development</b> School of Education University of Colorado-Boulder
2006-2011	<b>Director of Evaluation Research</b> Center for Technology in Learning SRI International
2000-2006	<b>Senior Education Researcher</b> Center for Technology in Learning SRI International
1998-2000	<b>Research Social Scientist</b> Center for Technology in Learning SRI International
1997-98	<b>Program Evaluator</b> San Francisco Unified School District
1996-97	<b>Program Evaluation Coordinator</b> Metropolitan Nashville Public Schools

## **COURSES TAUGHT**

**Cognitive Science Research Practicum**, University of Colorado  
**Advanced Qualitative Analysis**, University of Colorado  
**Compassion and Dignity for Educators**, University of Colorado  
**Designing Storylines for Curricular Transformation**, University of Colorado  
**Psychological Foundations of Education**, University of Colorado  
**Open Educational Resources in Science Education**, University of Colorado  
**Educational Evaluation**, University of Colorado  
**Seminar in Human Development**, University of Colorado  
**Adolescent Development and Educational Psychology**, University of Colorado  
**Adolescent Development for Teachers**, University of Colorado  
**Learning with Technology in and out of School**, University of Colorado  
**Contexts that Promote Youth Development**, Stanford University  
**Technology in Science Education**, University of South Carolina  
**Assessment of Student Multimedia Projects**, Foothill College

## MANUSCRIPTS IN PREPARATION

\*Student author

Bakker, A., \*Angerer, E., Penuel, W. R., & Akkerman, S. (in preparation). Causal reasoning about education: What is it and what should it be? In P. Illari & F. Russo (Eds.), *Handbook on causality*.

National Academies of Science, Engineering, and Medicine. (in preparation). *Equity in preK-12 STEM education*. Washington, DC: National Academies Press. [refereed consensus volume]

Penuel, W. R., Potvin, A. S., Dimidjian, S., & Jinpa, T. (in preparation). Leaders cultivate compassion and dignity within themselves and their schools. In K. Lasater & K. N. LaVenita (Eds.), *Compassionate leadership for school improvement and renewal*. Charlotte, NC: Information Age Publishing.

Potvin, A. S., Penuel, W. R., Dimidjian, S., & Jinpa, T. (in preparation). *Cultivating compassionate schools*. Jossey-Bass.

Suresh, A., Penuel, W. R., Jacobs, J., Sumner, T., & Martin, J. (in preparation). Using AI tools to provide teachers with fully automated, personalized feedback on their classroom discourse patterns. In X. Zhai & J. Krajcik (Eds.), *Applying AI in STEM assessment*. New York, NY: Oxford University Press.

## MANUSCRIPTS IN REVIEW

Chang, M., Sumner, T., Bush, J., Penuel, W. R., Philip, T. (under review). A framework of responsible and caring innovation: Realizing youth's expansive dreams for AI in classrooms. AAAI 2024 Workshop AI4ED.

Bush, J., Bidy, Q., Penuel, W. R., Chang, M., & Chakarov, A. G. (under review). Curriculum routines to support collaborative AI partner deployment in classrooms. International Conference of the Learning Sciences.

\*Hoang, N., Bush, J., \*Dey, I., \*Watts, E., Clevenger, C., & Penuel, W. R. (under review). MOSAIC Protocol: Analyzing small group work to gain insights into collaboration support for middle school STEM classrooms. International Conference of the Learning Sciences.

Raza, A., Penuel, W. R., Ahn, J., Jackson, K., Reinholz, D., Yeh, C., Lee, H., Fischer, F., & Maldonado, R. (under review). Expansive ways of knowing and improving: Using equity tools and approaches to support equity of participation in learning activities. International Conference of the Learning Sciences.

- \*Raza, A., Penuel, W. R., \*Li, J., & Frank, K. A. (under review). Enhancing the relevance of science learning for students owed an education debt: Exploring the potential of the Student Experience Improvement Cycle. *Journal of the Learning Sciences*.
- Soland, J., Penuel, W. R., Farrell, C. C. (under review). Developing a measure to evaluate education research-practice partnerships. *Research Evaluation*.
- Alzen, J., Buell, J., Edwards, K., Passmore, C., Penuel, W. R., Reiser, B, Griesemer, C. (in revision). Characterizing variations in the figured worlds of teachers and students in science class. *Journal of Research in Science Teaching*.
- \*Ceperich, R., Allen, A.-R., \*Tran, T., \*Salinas del Val, Y., Penuel, W. R., \*Leonhart, S., Rhinehart, A., & Davidson, K. L. (in revision). Science education leaders' sensemaking about equity through a vignette. *Science Education*.
- Farrell, C. C., Penuel, W. R., Arce-Trigatti, P., Soland, J., \*Singleton, C., Resnick, A. F., Stamatis, K., Riedy, R., Henrick, E., Sexton, S., \*Wellberg, S., & Schmidt, D. (in revision). Designing measures of complex collaborations with participatory, evidence-centered design. *Frontiers in Research Metrics and Analytics*.
- Potvin, A. S., Teeters, L. P., & Penuel, W. R. (in revision). Humanizing co-design through attention to educators' affective experiences. *Journal of the Learning Sciences*.
- \*Raza, A., Penuel, W. R., \*Li, J., & Frank, K. A. (in revision). Enhancing coherence from the student point of view: A design study. *Journal of Science Teacher Education*.
- \*Raza, A., Sumner, T., & Penuel, W. R. (in revision). The Science SEET: A study examining how different visualization forms support teachers to notice and reflect on inequalities in student classroom experiences. *Journal of Learning Analytics*.
- \*Singleton, C., \*Deverel-Rico, C., Penuel, W. R., Krumm, A., Allen, A.-R., & Pazera, C. (accepted, with major revisions). The role of equitable classroom cultures for supporting interest development in science. *Journal of Research in Science Teaching*.

## **REFEREED JOURNAL ARTICLES**

- Penuel, W. R., \*Raza, A., \*Salinas Del Val, Y., Salinas-Estavez, R., Williamson, E., Smith, J., & Gill, Q. (in press). Making formative use of student experience data to promote equity in a cycle of collaborative teacher inquiry. *Science Scope*.
- \*Riedy, R., & Penuel, W. R. (in press). Dignity-affirming care in research-practice partnerships. *Peabody Journal of Education*.
- Alvarez, A., Teeters, L. P., Penuel, W. R., & Esteban-Guitart, M. (2023). Principles to engage a funds of identity approach as a vehicle toward epistemic justice in

- educational settings. *Language, Culture, and Social Interaction*, 40, 100718.  
<https://doi.org/10.1016/j.lcsi.2023.100718>
- Alzen, J., Edwards, K., Penuel, W. R., Reiser, B. J., Passmore, C., Griesemer, C., \*Zivic, A., \*Murzynski, C., & Buell, J. Y. (2023). Characterizing relationships between collective enterprise and student epistemic agency in science: A comparative case study. *Journal of Research in Science Teaching*, 60(7), 1520-1550.  
<https://doi.org/10.1002/tea.21841>
- Farrell, C. C., \*Singleton, C., Stamatis, K., \*Riedy, R., Arce-Trigatti, P., & Penuel, W. R. (2023). Conceptions and practices toward equity in research-practice partnerships. *Educational Policy*, 37 (1), 200-224. <https://doi.org/10.1177/08959048221131566>
- Mawasi, A., Penuel, W. R. Cortez, A., & \*McKoy, A. (2023). “They were learning from us as we were learning from them”: Perceived experiences in co-design process. *Mind, Culture, Activity*. <https://doi.org/10.1080/10749039.2023.2246039>
- Penuel, W. R., Allen, A. R., \*Deverel-Rico, C., \*Singleton, C., & Pazera, C. (2023). How teachers’ knowledge of curriculum supports partnering with students in their science learning. *Journal of Science Teacher Education*.  
<https://doi.org/10.1080/1046560X.2023.2167508>
- Penuel, W. R., Krumm, A. E., Pazera, C., \*Singleton, C. A., Allen, A.-R., & \*Deverel-Rico, C. (2023). Belonging in science classrooms: Investigating its relation to students’ contributions and influence in knowledge building. *Journal of Research in Science Teaching*. <https://doi.org/10.1002/tea.21884>
- Farrell, C. C., Penuel, W. R., Allen, A.-R., Anderson, E., \*Bohannon, A., Coburn, C. E., & Brown, S. (2022). Learning at the boundaries of research and practice: A framework for understanding research-practice partnerships. *Educational Researcher*, 51 (3), 197-208. <https://doi.org/10.3102/0013189X211069073>
- Farrell, C. C., Penuel, W. R., & Davidson, K. L. (2022). “What counts” as research? Comparing policy guidelines to the evidence education leaders report as useful. *AERA Open* 8 (1), 1-17. <https://doi.org/10.1177/23328584211073157>
- Penuel, W. R. (2022). Algunos principios de aprendizaje equitativo post-pandemia. *Education in the Knowledge Society*, 23. e27567. <https://doi.org/10.14201/eks.27567>
- Penuel, W. R., Allen, A.-R., Henson, K., Campanella, M., Patton, R., Rademaker, K., Reed, W., Watkins, D. A., Wingert, K., Reiser, B. J., & Zivic, A. (2022). Learning practical design knowledge through co-designing storyline science curriculum units. *Cognition and Instruction*, 40(1), 148-170.  
<https://doi.org/10.1080/07370008.2021.2010207>
- Penuel, W. R., Reiser, B. J., McGill, T. A. W., Novak, M. Van Horne, K., Orwig, A. (2022). Connecting student interests and questions with science learning goals

- through project-based storylines. *Disciplinary and Interdisciplinary Science Education Research*, 4(1), 1-27. <https://doi.org/10.1186/s43031-021-00040-z>
- Potvin, A. S., Penuel, W. R., Dimidjian, S., & Jinpa, T. (2022). Cultivating skillful means of care in schools through compassion practice and individual and joint inquiry. *Mindfulness*. <https://doi.org/10.1007/s12671-022-01867-x>
- Wingert, K., Jacobs, J. K., Lindsay, W., Lo, A. S., Herrman-Abell, C. F., & Penuel, W. R. (2022). Understanding the priorities and practices of rural science teachers: Implications for designing professional learning. *The Rural Educator*, 43(3), 26-40. <https://doi.org/10.55533/2643-9662.1338>
- Akkerman, S., Bakker, A., & Penuel, W. R. (2021). Relevance of educational research: An ontological conceptualization. *Educational Researcher* 50 (6), 416-424. <https://doi.org/10.3102/0013189X211028239>
- Biddy, Q., Chakarov, A. G., Bush, J., Elliot, C. H., Jacobs, J. Recker, M., Sumner, T., Penuel, W. R. (2021). A professional development to integrate computational thinking into middle-school science through co-designed storylines. *Contemporary Issues in Technology and Teacher Education*, 21 (1), 53-96. <https://www.learntechlib.org/p/216072/>
- Edelson, D. C., Reiser, B. J., McNeill, K. L., Mohan, A., Novak, M., Mohan, L., Affolter, R., McGill, T., Bracey, Z. B., Noll, J. D., Kowalski, S., Novak, D., Lo, A., Landel, C., Krumm, A., Penuel, W. R., Van Horne, K., González-Howard, M., & Suárez, E. (2021). Developing research-based instructional materials to support large-scale transformation of science teaching and learning: The approach of the OpenSciEd middle school program. *Journal of Science Teacher Education*, 32(7), 780-804. <https://doi.org/10.1080/1046560X.2021.1877457>
- Penuel, W. R., Furtak, E. M., & Farrell, C. C. (2021). Research-practice partnerships in education: Advancing an evolutionary logic of systems improvement. *Die Deutsche Schule*, 113(1), 45-62. <https://doi.org/10.31244/ddS.2021.01.05>
- Reiser, B. J., Novak, M., McGill, T. A. W., & Penuel, W. R. (2021). Storyline units: An instructional model to support coherence from the students' perspective. *Journal of Science Teacher Education*, 32(7), 805-829. <https://doi.org/10.1080/1046560X.2021.1884784>
- DiGiacomo, D., Van Horne, K., & Penuel, W. R. (2020). Choice and interest in designed learning environments: The case of FUSE Studios. *Information and Learning Sciences*. <https://doi.org/10.1108/ILS-09-2019-0098>
- Esteban-Guitart, M., DiGiacomo, D. K., Penuel, W. R., & Ito, M. (2020). Principios, aplicaciones y retos del aprendizaje conectado. *Contextos Educativos: Revista de Educación*, 27, 157-176. <https://doi.org/10.18172/con.3966>

- Penuel, W. R., \*Riedy, R., Barber, M. Puerach, D., LeBoeuf, W., & Clark, T. (2020). Principles of collaborative education research with stakeholders: Toward requirements for a new research and development infrastructure. *Review of Educational Research*. <https://doi.org/10.3102/0034654320938126>
- Staus, N. L., Falk, J. H., Penuel, W. R., Dierking, L., Wyld, J., & Bailey, D. (2020). Interested, disinterested, or neutral: Exploring STEM interest profiles and pathways in a low-income urban community. *EURASIA Journal of Mathematics, Science and Technology Education* 16 (6), em1853. <https://doi.org/10.29333/ejmste/7927>
- Penuel, W. R. & Hill, H. C. (2019). Building a knowledge base on research-practice partnerships: Introduction to the special topic collection. *AERA Open*, 5 (4), 1-5. <https://doi.org/10.1177/2332858419891950>
- Furtak, E. M., & Penuel, W. R. (2019). Coming to terms: Addressing the persistence of “hands-on” and other reform terminology in the era of science-as-practice. *Science Education*, 103 (1), 167-186. <https://doi.org/10.1002/sce.21488>
- \*Kaplan, R. G., \*Riedy, R., Van Horne, K., & Penuel, W. R. (2019). Going on a statewide listening tour: Involving education leaders in the process of research to enhance the practical value of qualitative research. *Evidence and Policy: A Journal of Research, Debate, and Practice*, 15 (2) 179-196. <https://doi.org/10.1332/174426518X15193816575650>
- Penuel, W. R. (2019). Infrastructuring as a practice of design-based research for supporting and studying equitable implementation and sustainability of innovations. *Journal of the Learning Sciences*, 28 (4-5), 659-677. <https://doi.org/10.1080/10508406.2018.1552151>
- Penuel, W. R., Turner, M. L., Jacobs, J. K., Van Horne, K., & Sumner, T. (2019). Developing tasks to assess phenomenon-based science learning: Challenges and lessons learned from building proximal transfer tasks. *Science Education*, 103 (6), 1367-1395. <https://doi.org/10.1002/sce.21544>
- Penuel, W. R., & \*Watkins. D. (2019). Building a system of assessment in a school system to promote equity and epistemic justice: A use-case of a research-practice partnership in science education. *Annals of the American Academy of Political and Social Science*, 683, 201-216. <https://doi.org/10.1177/0002716219843249>
- Allen, C. D., DiGiacomo, D., Van Horne, K., & Penuel, W. R. (2018). Pursuing interests and getting involved: Exploring the conditions of sponsorship in youth learning. *Digital Education Review*, 33, 120-129. <https://doi.org/10.1344/der.2018.33.120-129>
- Anderson, C. W., de Los Santos, E. X., Bodbyl, S., Covitt, B. A., Edwards, K., \*Hancock, B., \*Lin, Q., Penuel, W. R., Thomas, C. M., Welch, M. (2018).

- Designing educational systems to support enactment of the Next Generation Science Standards. *Journal of Research in Science Teaching*, 55 (7), 1026-1052.  
<https://doi.org/10.1002/tea.21484>
- DiGiacomo, D., Van Horne, K., \*Van Steenis, E., & Penuel, W. R. (2018). The material and social constitution of interest. *Language, Culture, and Social Interaction*, 19, 51-60.  
<https://doi.org/10.1016/j.lcsi.2018.04.010>
- Esteban-Guitart, M., Coll, C., & Penuel, W. R. (2018). Learning across settings and time in a digital age. *Digital Education Review*, 33, 1-16.  
<https://doi.org/10.1344/der.2018.33.%25p>
- Frank, K. A., \*Xu, R., & Penuel, W. R. (2018). Implementation of evidence-based practice in human service organizations: Implications from agent-based models. *Journal of Policy Analysis and Management*, 37(4), 867-895.  
<https://doi.org/10.1002/pam.22081>
- Hopkins, M., Wiley, K., Penuel, W. R., & Farrell, C. C. (2018). Brokering research in science education policy implementation: The case of a professional association. *Evidence and Policy: A Journal of Research, Debate, and Practice*, 14 (3), 459-476.  
<https://doi.org/10.1332/174426418X15299595170910>
- Penuel, W. R., Bell, P., Neill, T., Shaw, S., Hopkins, M., & Farrell, C. C. (2018). Building a Networked Improvement Community to promote equitable, coherent systems of science education. *AASA Journal of Scholarship and Practice*, 15(1), 30-38.
- Penuel, W. R., Farrell, C. C., Allen, A.-R., \*Toyama, Y., & Coburn, C. E. (2018). What research district leaders find useful. *Educational Policy*, 32(4), 540-568.  
<https://doi.org/10.1177/0895904816673580>
- Penuel, W. R. & O'Connor, K. (2018). From designing to organizing new social futures: Multiliteracies pedagogies for today. Special issue. *Theory into Practice*, 57(1), 64-71.  
<https://doi.org/10.1080/00405841.2017.1411715>
- Shepard, L. A., Penuel, W. R., & Pellegrino, J. W. (2018). Using learning and motivation theories to coherently link formative assessment, grading practices, and large-scale assessment. *Educational Measurement: Issues and Practice*, 37(1), 21-34.  
<https://doi.org/10.1111/emip.12189>
- Shepard, L. A., Penuel, W. R., & Pellegrino, J. W. (2018). Classroom assessment principles to support learning and avoid the harms of testing. *Educational Measurement: Issues and Practice*, 37(1), 52-57. <https://doi.org/10.1111/emip.12195>
- \*Cartun, A., Penuel, W. R., & \*West-Puckett, S. (2017). Blurring the boundaries between school and community: Implementing connected learning principles in English classrooms. *Journal of Adolescent and Adult Literacy*, 61 (2), 183-190.  
<https://doi.org/10.1002/jaal.668>

- Huguet, A., Allen, A.-R., Coburn, C. E., Farrell, C. C., Kim, D. H., & Penuel, W. R. (2017). Locating data use in the microprocesses of district-level deliberations. *Nordic Journal of Studies in Educational Policy*, 3 (1), 21-28. <https://doi.org/10.1080/20020317.2017.1314743>
- Maul, A., Penuel, W. R., Gallagher, L., \*Dadey, N., Podkul, T., & \*Price, E. (2017). Developing a measure of interest-related pursuits: The Connected Learning survey. *Educational Technology Research and Development*, 65 (1), 1-28. <http://dx.doi.org/10.1007/s11423-016-9453-6>
- Penuel, W. R. (2017). Research-practice partnerships as a strategy for promoting equitable science teaching and learning through leveraging everyday science. *Science Education* 101 (5), 520-525. <https://doi.org/10.1002/sce.21285>
- Penuel, W. R., Briggs, D. C., Davidson, K. L., Herlihy, C., \*Sherer, D. Hill, H. C., Farrell, C. C., Allen, A.-R. (2017). How school and district leaders access, perceive, and use research. *AERA Open* 3 (2), 1-17. <https://doi.org/10.1177/2332858417705370>
- Penuel, W. R., DeBarger, A. H., Boscardin, C. K., Moorthy, S., Beauvineau, Y., Kennedy, C. A., & \*Allison, K. (2017). Investigating purposeful curriculum adaptation as a strategy to improve science teaching and learning. *Science Education*, 101 (1), 66-98. <https://doi.org/10.1002/sce.21249>
- Penuel, W. R., Van Horne, K., \*DiGiacomo, D., & Kirshner, B. (2016). A social practice theory of learning and becoming across contexts and time. *Frontline Learning Research* 4 (4), 30-38. <https://doi.org/10.14786/flr.v4i4.205>
- Penuel, W. R., Clark, T. L., & Bevan, B. (2016). Infrastructures to support equitable STEM learning across settings. *Afterschool Matters*, 24, 12-20.
- \*Severance, S., Penuel, W. R., Leary, H., & Sumner, T. (2016). Organizing for teacher agency in curricular co-design. *The Journal of the Learning Sciences*, 25 (4), 531-564. <https://doi.org/10.1080/10508406.2016.1207541>
- Coburn, C. E., & Penuel, W. R. (2016). Research-practice partnerships in education: Outcomes, dynamics, and open questions. *Educational Researcher*, 45(1), 48-54. <https://doi.org/10.3102/0013189X16631750>
- DeBarger, A. H., Penuel, W. R., Harris, C. J., & Kennedy, C. A. (2016). Building an assessment argument to design and use NGSS assessments to evaluate the efficacy of curriculum interventions. *American Journal of Evaluation*, 37(2), 174-192. <https://doi.org/10.1177/1098214015581707>
- Falk, J. H., Dierking, L., Staus, N., Penuel, W. R., \*Bailey, D., & \*Wyld, J. (2016). Understanding youth STEM interest and participation pathways within a

- community: The Synergies Project. *International Journal of Science Education, Part B*, 6 (4), 269-384. <https://doi.org/10.1080/21548455.2015.1093670>
- \*Johnson, R., Penuel, W. R., \*Severance, S., & \*Leary, H. (2016). Teachers, tasks, and tensions: Lessons from a research-practice partnership. *Journal of Mathematics Teacher Education* 19 (2), 169-185. <https://doi.org/10.1007/s10857-015-9338-3>
- Leary, H., \*Severance, S., Penuel, W. R., \*Quigley, D., Sumner, T., & Devaul, H. (2016). Designing a deeply digital science curriculum: Supporting teacher learning and implementation with organizing technologies. *Journal of Science Teacher Education*, 27 (1), 61-77. <https://doi.org/10.1007/s10972-016-9452-9>
- Penuel, W. R. (2016). Studying science and engineering learning in practice. *Cultural Studies in Science Education*, 11(1), 89-104. <https://doi.org/10.1007/s11422-014-9632-x>
- Penuel, W. R., Bevan, B., Bell, P., Falk, J., & Buffington, P. (2016). Using social networks to enhance research use in planning for and supporting educational change. *Journal of Educational Change* 17 (2), 251-278. <https://doi.org/10.1007/s10833-015-9266-0>
- \*Allen, C. D., & Penuel, W. R. (2015). Studying teachers' sensemaking to analyze teachers' responses to professional development focused on new standards. *Journal of Teacher Education* 66 (2), 136-149. <https://doi.org/10.1177/0022487114560646>
- Frank, K. A., Penuel, W. R., & Krause, A. E. (2015). What is a "good" social network for a system? The flow of know-how for organizational change. *Journal of Policy Analysis and Management*, 34(2), 378-402. <https://doi.org/10.1002/pam.21817>
- Penuel, W. R. (2015). Commentary on Briggs and Peck: Learning progressions as evolving tools in joint enterprises. *Measurement: Interdisciplinary Research and Perspectives* 13 (2), 123-127. <https://doi.org/10.1080/15366367.2015.1055145>
- Penuel, W. R., Allen, A.-R., Farrell, C., & Coburn, C. E. (2015). Conceptualizing research-practice partnerships as joint work at boundaries. *Journal for Education of Students at Risk (JESPAR)* 20 (1-2), 182-197. <https://doi.org/10.1080/10824669.2014.988334>
- Penuel, W. R., Harris, C. J., D'Angelo, C., DeBarger, A. H., Gallagher, L. P., Kennedy, C. A., & Cheng, B. H. (2015). Impact of project-based curriculum materials on student learning in science: Results of a randomized controlled trial. *Journal of Research in Science Teaching*, 52(10), 1362-1385. <https://doi.org/10.1002/tea.21263>
- Penuel, W. R., Phillips, R. A., & Harris, C. J. (2014). Analysing curriculum implementation from integrity and actor-oriented perspectives. *Journal of Curriculum Studies*, 46 (6), 751-777. <https://doi.org/10.1080/00220272.2014.921841>

- Hegedus, S., Dalton, S., Roschelle, J., Penuel, W. R., Dickey-Kurdziolek, M., & Tatar, D. (2014). Investigating why teachers continued use and sharing of an educational innovation after the research has ended. *Mathematical Thinking and Learning*, 16 (4), 1-22. <https://doi.org/10.1080/10986065.2014.953017>
- Penuel, W. R. (2014). Emerging forms of intervention research in education. *Mind, Culture, Activity*, 21 (2), 97-117. <https://doi.org/10.1080/10749039.2014.884137>
- Penuel, W. R., Confrey, J., Maloney, A., Rupp, A. A. (2014). Design decisions in developing assessments of learning trajectories. *The Journal of the Learning Sciences*, 23 (1), 47-95. <https://doi.org/10.1080/10508406.2013.866118>
- Gutiérrez, K. D., & Penuel, W. R. (2014). Relevance to practice as a criterion for rigor. *Educational Researcher*, 43 (1), 19-23. <https://doi.org/10.3102/0013189X13520289>
- Sun, M., Penuel, W. R., Frank, K. A., Gallagher, H. A., & Youngs, P. A. (2013). Shaping professional development to promote the diffusion of instructional expertise among teachers. *Educational Evaluation and Policy Analysis*, 35 (3), 344-369. <https://doi.org/10.3102/0162373713482763>
- Sun, M., Frank, K. A., Penuel, W. R., & Kim, C. (2013). How external institutions penetrate schools through formal and informal leaders. *Educational Administration Quarterly* 49 (4), 610-644. <https://doi.org/10.1177/0013161X12468148>
- Penuel, W. R., Frank, K. A., Sun, M., Kim, C., & Singleton, C. (2013). The organization as a filter of institutional diffusion. *Teachers College Record*, 115 (1), 1-33. <https://doi.org/10.1177/016146811311500105>
- Boscardin, C., & Penuel, W. R. (2012). Exploring benefits of audience-response systems on learning: A review of the literature. *Academic Psychiatry*, 36, 401-407. <https://doi.org/10.1176/appi.ap.10080110>
- Hand, V., Penuel, W. R., & Gutiérrez, K. D. (2012). (Re)framing educational possibility: Attending to power and equity in shaping access to and within learning opportunities. *Human Development*, 55, 250-268. <https://doi.org/10.1159/000345313>
- Harris, C. J., \*Phillips, R. S., & Penuel, W. R. (2012). Examining teachers' instructional moves aimed at developing students' ideas and questions in learner-centered science classrooms. *Journal of Science Teacher Education*, 23(7), 768-788. <https://doi.org/10.1007/s10972-011-9237-0>
- Penuel, W. R., & Fishman, B. J. (2012). Large-scale intervention research we can use. *Journal of Research in Science Teaching*, 49(3), 281-304. <https://doi.org/10.1002/tea.21001>

- Penuel, W. R., Bates, L., Gallagher, L. P., Pasnik, S., Llorente, C., Townsend, E., Domínguez, X., VanderBorgh, M. (2012). Supplementing literacy instruction with a media-rich intervention: Results of a randomized controlled trial. *Early Childhood Research Quarterly*, 27 (1), 115-127.  
<https://doi.org/10.1016/j.ecresq.2011.07.002>
- Penuel, W. R., \*Sun, M., Frank, K. A., & Gallagher, H. A. (2012). Using social network analysis to study how collegial interactions can augment teacher learning from external professional development. *American Journal of Education*, 119 (1), 103-136.  
<https://doi.org/10.1086/667756>
- Koch, M., Gorges, T., & Penuel, W. R. (2012). Build IT: Scaling and sustaining an afterschool computer science program for girls. *Afterschool Matters*, 16, 58-66.
- Penuel, W. R., Fishman, B. J., Cheng, B. H., & Sabelli, N. (2011). Organizing research and development at the intersection of learning, implementation, and design. *Educational Researcher*, 40(7), 331-337. <https://doi.org/10.3102/0013189X11421826>
- Penuel, W. R., & Means, B. (2011). Using large-scale databases in evaluation: Advances, opportunities, and challenges. *American Journal of Evaluation* 32(1), 118-133.  
<https://doi.org/10.1177/1098214010388268>
- Penuel, W. R., Gallagher, L. P., & Moorthy, S. (2011). Preparing teachers to design sequences of instruction in Earth science: A comparison of three professional development programs. *American Educational Research Journal*, 48 (4), 996-1025.  
<https://doi.org/10.3102/0002831211410864>
- Penuel, W. R., Singleton, C., & Roschelle, J. (2011). Classroom network technology as a support for systemic mathematics reform: Examining the effects of Texas Instruments' MathForward Program on student achievement in a large, diverse district. *Journal of Computers in Mathematics and Science Teaching*, 30 (2), 179-202.  
<https://www.learntechlib.org/p/33242/>
- Fishman, B. J., Penuel, W. R., Hegedus, S., & Roschelle, J. (2011). What happens when the research ends? Factors related to the sustainability of a technology-infused mathematics curriculum. *Journal of Computers in Mathematics and Science Teaching*, 30(4), 329-353. <https://www.learntechlib.org/p/36145/>
- Frank, K. A., Zhao, Y., Penuel, W. R., Ellefson, N., & Porter, S. (2011). Focus, fiddle and friends: A longitudinal study of characteristics of effective technology professional development. *Sociology of Education*, 84 (2), 137-156.  
<https://doi.org/10.1177/0038040711401812>
- Shear, L., & Penuel, W. R. (2010). Rock-solid support: Florida district weighs effectiveness of science professional learning. *Journal of Staff Development*, 31(5), 48-51.

- Penuel, W. R., Riel, M., \*Joshi, A., & Frank, K. A., (2010). The alignment of the informal and formal supports for school reform: Implications for improving teaching in schools. *Educational Administration Quarterly*, 46(1), 57-95. <https://doi.org/10.1177/1094670509353180>
- Penuel, W. R., & Gallagher, L. P. (2009). Preparing teachers to design instruction for deep understanding in middle school Earth science. *The Journal of the Learning Sciences*, 18(4), 461-508. <https://doi.org/10.1080/10508400903191904>
- Penuel, W. R., McWilliams, H., McAuliffe, C., Benbow, A., Mably, C., & Hayden, M. (2009). Teaching for understanding in Earth science: Comparing impacts on planning and instruction in three professional development designs for middle school science. *Journal of Science Teacher Education*, 20 (5), 415-436. <http://doi.org/10.1007/s10972-008-9120-9>
- Penuel, W. R., Fishman, B. J., Gallagher, L. P., Lopez-Prado, B., & Korbak, C. (2009). Is alignment enough? Investigating the effects of state policies and professional development on science curriculum implementation. *Science Education*, 93(4), 656-677. <https://doi.org/10.1002/sc.20321>
- Penuel, W. R., Riel, M., Frank, K. A., & Krause, A. (2009). Analyzing teachers' professional interactions in a school as social capital: A social network approach. *Teachers College Record*, 11(1), 124-163. <https://doi.org/10.1177/016146810911100102>
- Roschelle, J., Rafanan, K., Bhanot, R., Estrella, G., Penuel, W. R., Nussbaum, M., & Claro, S. (2009). Scaffolding group explanation and feedback with handheld technology: Impact on students' mathematics learning. *Educational Technology Research and Development*, 58(4), 399-419. <https://doi.org/10.1007/s11423-009-9142-9>
- Hegedus, S. J., & Penuel, W. R. (2008). Studying new forms of participation and identity in mathematics classrooms with integrated communication and representational infrastructures. *Educational Studies of Mathematics* 68 (2), 171-184. <https://doi.org/10.1007/s10649-008-9120-x>
- Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. P. (2007). What makes professional development effective? Strategies that foster curriculum implementation. *American Educational Research Journal*, 44(4), 921-958. <https://doi.org/10.3102/0002831207308221>
- Penuel, W. R., Roschelle, J., & Shechtman, N. (2007). Designing formative assessment software with teachers: An analysis of the co-design process. *Research and Practice in Technology Enhanced Learning*, 2(1), 1-24. <https://doi.org/10.1142/S1793206807000300>

- Penuel, W. R., Boscardin, C. K., Masyn, K., & Crawford, V. M. (2007). Teaching with student response systems in elementary and secondary education settings: A survey study. *Educational Technology Research and Development*, 55(4), 315-346. <https://doi.org/10.1007/s11423-006-9023-4>
- Penuel, W. R., Sussex, W., Korbak, C., & Hoadley, C. (2006). Investigating the potential of using social network analysis in educational evaluation. *American Journal of Evaluation*, 27(4), 437-451. <https://doi.org/10.1177/1098214006294307>
- Penuel, W. R. (2006). Implementation and effects of 1:1 computing initiatives: A research synthesis. *Journal of Research on Technology in Education*, 38(3), 329-348. <https://doi.org/10.1080/15391523.2006.10782463>
- Yarnall, L., Shechtman, N., & Penuel, W. R. (2006). Using handheld computers to support improved classroom assessment in science: Results from a field trial. *Journal of Science Education and Technology*, 15(1), 1-17. <https://doi.org/10.1007/s10956-006-9008-4>
- Penuel, W. R., Shear, L., Korbak, C., & Sparrow, E. (2005). The roles of regional partners in supporting an international Earth science education program. *Science Education*, 89(6), 956-979. <https://doi.org/10.1002/sce.20079>
- Penuel, W. R., & Yarnall, L. (2005). Designing handheld software to support classroom assessment: An analysis of conditions for teacher adoption. *Journal of Technology, Learning, and Assessment*, 3 (5). Available from <http://www.jtla.org>.
- Roschelle, J., Penuel, W. R., Yarnall, L., & Shechtman, N. (2005). Handheld tools that “informat” assessment of student learning in science: A requirements analysis. *Journal of Computer Assisted Learning*, 21(3), 190-203. <https://doi.org/10.1111/j.1365-2729.2005.00127.x>
- Penuel, W. R., Tatar, D., Roschelle, J., & Yarnall, L. (2004). The role of research on contexts of teaching practice in informing the design of handheld learning technologies. *Journal of Educational Computing Research*, 30(4), 331-348. <https://doi.org/10.2190/FJ51-5W3V-GGMC-4A92>
- Penuel, W. R., & Means, B. (2004). Implementation fidelity and variation in a science inquiry program. *Journal of Research in Science Teaching*, 41(3), 294-315. <https://doi.org/10.1002/tea.20002>
- Tatar, D., Roschelle, J., Vahey, P., & Penuel, W. R. (2003). Handhelds go to school. *IEEE Computer*, 36(9), 58-65. <https://doi.org/10.1109/MC.2003.1231192>
- Means, B., Roschelle, J., Penuel, W. R., Sabelli, N., & Haertel, G. D. (2003). Technology’s contribution to teaching and policy: Efficiency, standardization, or transformation? *Review of Educational Research*, 27, 159-181. <https://www.jstor.org/stable/3568130>

- Yarnall, L., Penuel, W. R., Ravitz, J., Murray, G., Means, B., & \*Broom, M. (2003). Portable assessment authoring: Using handheld technology to assess collaborative inquiry. *Education, Communication, Information*, 3(1), 7-55. <https://doi.org/10.1080/14636310303147>
- Cole, K., Simkins, M., & Penuel, W. R. (2002). Learning to teach with technology: Strategies for inservice professional development. *Journal of Technology and Teacher Education*, 10 (3), 431-455. <https://www.learntechlib.org/primary/p/26282/>
- Shear, L., & Penuel, W. R. (2002). Putting the 'learning' in adventure learning: Design principles for technology-supported classroom inquiry. *Journal of Curriculum Supervision*, 17, 315-335.
- Coleman, E. B., & Penuel, W. R. (2000). Web-based student assessment for program evaluation. *Journal of Science Education and Technology*, 9(4), 327-342. <https://doi.org/10.1023/A:1009432509448>
- Davey, T. L., Penuel, W. R., Allison-Tant, E., & Rosner, A. M. (2000). The HERO program: A case for school social work services. *Social Work in Education*, 22(3), 177-190. <https://doi.org/10.1093/cs/22.3.177>
- Penuel, W. R., & Davey, T. L. (1999). 'I don't like to nowhere but here!' The shelter as mediator of U.S. homeless youth's identity formation. *Mind, Culture, and Activity*, 6, 222-236. <https://doi.org/10.1080/10749039909524727>
- Penuel, W. R. & \*Freeman, T. (1997). Participatory action research in youth work practice. Special issue: Research methods in child and youth care practice. *Child and Youth Care Forum*, 26, 175-186. <https://doi.org/10.1007/BF02589384>
- Penuel, W. R. (1997). Between self and tribe: Revising some modernist notions for a postmodern world. *Theory and Psychology*, 7(5), 703-708. <https://doi.org/10.1177/0959354397075008>
- Penuel, W. R. (1996). Hearing different voices: Two languages in youth work practice. *Journal of Child and Youth Care Work*, 11, 84-95.
- Penuel, W. R. & Wertsch, J. V. (1995). Dynamics of negation in the identity politics of cultural Other and cultural self. *Culture and Psychology*, 1(3), 343-359. <https://doi.org/10.1177/1354067X9513002>
- Penuel, W. R. & Wertsch, J. V. (1995). Vygotsky and identity formation: A sociocultural approach. *Educational Psychologist*, 30(2), 83-92. [https://doi.org/10.1207/s15326985ep3002\\_5](https://doi.org/10.1207/s15326985ep3002_5)

## REFEREED CONSENSUS REPORTS

National Research Council. (2014). *Assessment and the Next Generation Science Standards*. Washington, DC: National Academies Press.

## REFEREED CONFERENCE PROCEEDINGS

\*Chandler, C., Reitman, J., Breideband, T., \*Chitwood, M., Howard, A., Leonhart, S., Foltz, P., Penuel, W. R., & D'Mello, S. K. (forthcoming). CoBi AI partner: Enhancing collaborative learning experiences through adaptive in-class feedback. In *Proceedings of the 2024 Learning Analytics and Knowledge Conference*. Society for Learning Analytics Research.

Breideband, T., Bush, J. B., \*Chandler, C., Chang, M. A., Dickler, R., Foltz, P., \*Ganesh, A., Lieber, R., Penuel, W. R., Reitman, J. G., Weatherley, J., & D'Mello, S. K. (2023). The Community Builder (CoBi): Helping students to develop better small group collaborative learning skills. In *CSCW '23 Companion, October 14–18, 2023* (pp. 1-5). Association for Computing Machinery. <https://doi.org/10.1145/3584931.3607498>.

\*Deverel-Rico, C., Penuel, W. R., Rubin, A., Puttick, G., & Henson, K. (2023). Supporting alignments in scientific activity: Moving across question, evidence, and explanation. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.), *Proceedings of the 17th International Conference of the Learning Sciences 2023* (pp. 321-328). International Society of the Learning Sciences.

Fishman, B. J., Herrenkohl, L., Pinkard, N., Taylor, K. H., Cederquist, S., Gu, X., Jones, D., Lee, J., Lee, L., Majors, Y., Reid, C., Samuelson, A., Henriquez, A., Penuel, W. R., & Pepler, K. (2023). Out-of-school time: Divergent learning, divergent opportunities. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.), *Proceedings of the 17th International Conference of the Learning Sciences 2023* (pp. 321-328). International Society of the Learning Sciences.

Ko, M.-L. M., Cortez, A., & Penuel, W. R. (2023). Curriculum as seed: Designing and supporting the use of Open Education Resources to promote teacher agency and innovation. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.), *Proceedings of the 17th International Conference of the Learning Sciences 2023* (pp. 1014-1017). International Society of the Learning Sciences.

Penuel, W. R., Rubin, A., Henson, K., Puttick, G., & \*Deverel-Rico, C. (2023). A teaching routine for working with existing data in science classrooms. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.), *Proceedings of the 17th International Conference of the Learning Sciences 2023* (pp. 1680-1681). International Society of the Learning Sciences.

- Potvin, A. S., & Penuel, W. R. (2023). Educators' ideas about dignity and how to support it in schools. In P. Blikstein, J. Van Aalst, R. Kizito, & K. Brennan (Eds.), *Proceedings of the 17th International Conference of the Learning Sciences 2023* (pp. 2020-2021). International Society of the Learning Sciences.
- Lo, A., \*Glidewell, L., \*O'Connor, K., Allen, A. R., Herrmann-Abell, C. F., Penuel, W. R., Wingert, K., & Lindsay, W. (2022). Promoting shifts in teachers' understanding and use of phenomena in instruction and assessment. *Proceedings of the International Society for the Learning Sciences Annual Meeting* (pp. 1145-1159). Nagasaki, Japan: International Society of the Learning Sciences.
- Mawasi, A., Cortez, A., \*McKoy, A., & Penuel, W. R. (2022). "It disrupts power dynamics": Co-Design process as a space for intergenerational learning with distributed expertise. *Proceedings of the International Society for the Learning Sciences Annual Meeting* (pp. 925-928). Nagasaki, Japan: International Society of the Learning Sciences.
- Potvin, A., Teeters, L. P., & Penuel, W. R. (2021). Designing for compassion in schools: A humanizing approach to co-design. In E. de Vries, Y. Hod, & J. Ahn (Eds.), *Proceedings of the International Society of the Learning Sciences Annual Meeting* (pp. 131-138). Bodum, Germany: International Society of the Learning Sciences.
- \*Raza, A., Penuel, W. R., Allen, A.-R., Sumner, T., & Jacobs, J. K. (2021). "Making it culturally relevant": A visual learning analytics system supporting teachers to reflect on classroom equity. In E. de Vries, Y. Hod, & J. Ahn (Eds.), *Proceedings of the 15th International Conference of the Learning Sciences* (pp. 442-449). Bochum, Germany: International Society of the Learning Sciences.
- \*Stamatis, K., \*Pradhan, I., & Penuel, W. R. (2021). Becoming a STEAM teacher: Co-construction of a zone of proximal identity development to support program implementation. In E. de Vries, Y. Hod, & J. Ahn (Eds.), *Proceedings of the 15th International Conference of the Learning Sciences* (pp. 983-984). Bochum, Germany: International Society of the Learning Sciences.
- Alzen, J., Edwards, K., Penuel, W. R., Reiser, B. J., Passmore, C., Griesemer, C., \*Zivic, A., & \*Murzynski, C. (2020). Exploring the connections between epistemic agency and a commitment to the collective enterprise of sensemaking in the science classroom. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.
- Biddy, Q., Penuel, W. R., Henson, K., & Wingert, K. (2020). From three to five dimensions: Design heuristics for science assessments that elicit interest and identity. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International*

*Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.

Edelson, D. C., Reiser, B. J., McNeill, K. L., Affolter, R., Krumm, A., & Penuel, W. R. (2020). Bridging research and practice to implement change in teaching and learning at scale. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.

Esteban-Guitart, M., & Penuel, W. R. (2020). Global nationalism, curriculum, and identities. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.

Farrell, C. C., Penuel, W. R., Coburn, C. E., Allen, A.-R., Brown, S., \*Daniel, J., \*Steup, L., \*Bohannon, A. (2020). Learning at the boundaries of research and practice: A framework for understanding research-practice partnerships. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.  
***Nominated for Best Paper Award.***

Griesemer, C. D., \*Zivic, A., Edwards, K., \*Murzynski, C., \*Smith, J. F. T., Alzen, J. L., Passmore, C., Penuel, W. R., & Reiser, B. J. (2020). The Virtual Study Group as a context for supporting teacher learning and studying teacher cognition about implementation and promotion of classroom discussion. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.

Krumm, A., Penuel, W. R., Pazera, C., & Landel, C. (2020). Measuring equitable science instruction at scale. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.

Wardrip, P. S., Chang, S., Penny, L., Abramovich, S., Millerjohn, R., Martin, C., \*Widman, S., Penuel, W. R., Chang-Order, J., & Halverson, E. (2020). Assessment in hands-on library learning spaces. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.

\*Widman, S., Repko-Erwin, M., Penuel, W. R., & Stevens, R. (2020). Boundary crossing as a lens for examining scale in collaborative learning sciences innovations. In M.

- S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.
- Wingert, K., \*Riedy, R., \*Campanella, M., & Penuel, W. R. (2020). Equity across state systems: Possibilities and tensions in understanding scale. In M. S. Gresalfi, I. S. Horn, N. Enyedy, H.-J. So, V. Hand, K. Jackson, S. E. McKenney, A. Leftstein, & T. M. Philip (Eds.), *Proceedings of the International Conference of the Learning Sciences*. Nashville, TN: International Society of the Learning Sciences.
- Penuel, W. R., \*de Los Santos, E. X., \*Lin, Q., \*Marshall, S., Anderson, C. W., & Frank, K. A. (2018). *Building networks to support effective use of science curriculum materials in the Carbon TIME Project*. In J. Kay & R. Luckin, *Proceedings of the 13<sup>th</sup> International Conference of the Learning Sciences* (Vol 2., pp. 1236-1237). London, UK: International Society of the Learning Sciences.
- Penuel, W. R., Van Horne, K., & Wingert, K. (2018). Preparing teachers to notice key dimensions of next generation science assessment tasks. In J. Kay & R. Luckin, *Proceedings of the 13<sup>th</sup> International Conference of the Learning Sciences* (Vol 2., pp. 1215-1218). London, UK: International Society of the Learning Sciences.
- \*Riedy, R., Van Horne, K., Bell, P., Penuel, W. R., Neill, T., & Shaw, S. (2018). Mapping networks to help education leaders gain insights into complex educational systems. In J. Kay & R. Luckin, *Proceedings of the 13<sup>th</sup> International Conference of the Learning Sciences* (Vol 1., pp. 656-662). London, UK: International Society of the Learning Sciences.
- Bell, P., \*Severance, S., Penuel, W. R., Sumner, T., \*Mommandi, W., \*Quigley, D., Van Horne, K., \*Johnson, R., Stromholt, S., \*Lakhani, H., Davis, K., Bell, A., & Bang, M. (2016). Researchers and practitioners co-designing for expansive science learning and educational equity. In C.-K. Looi, J. L. Polman, U. Cress, & P. Reimann (Eds.), *Proceedings of the 12<sup>th</sup> International Conference of the Learning Sciences* (Vol. 2, pp. 1128-1135). Singapore: International Society of the Learning Sciences.
- Penuel, W. R., Van Horne, K., \*Severance, S., \*Quigley, D., & Sumner, T. (2016). Students' responses to curricular activities as indicator of coherence in project-based science. In C.-K. Looi, J. L. Polman, U. Cress, & P. Reimann (Eds.), *Proceedings of the 12<sup>th</sup> International Conference of the Learning Sciences* (Vol. 2, pp. 855-858). Singapore: International Society of the Learning Sciences.
- Van Horne, K., \*Van Steenis, E., Penuel, W. R., & \*DiGiacomo, D. (2016). Disruptions to practice: Understanding suspensions of youths' interest-related activities. In C.-K. Looi, J. L. Polman, U. Cress, & P. Reimann (Eds.), *Proceedings of the 12<sup>th</sup> International Conference of the Learning Sciences* (Vol. 1, pp. 482-489). Singapore: International Society of the Learning Sciences.

Penuel, W. R., \*Severance, S., \*Johnson, R., Leary, H., & \*Miller, S. (2014). Negotiating the object of codesign. In J. L. Polman, E. A. Kyza, D. K. O'Neill, I. Tabak, W. R. Penuel, A. S. Jurow, K. O'Connor, T. R. Lee & L. D'Amico (Eds.), *Learning and Becoming in Practice: The International Conference of the Learning Sciences (ICLS) 2014*. Boulder, CO: International Society of the Learning Sciences.

Penuel, W. R., Falk, J. H., Dierking, L. D., Kirshner, B., Haun-Frank, J., & \*York, A. J. (2012). Locating the development of interest: Tools for studying the mutual constitution of persons and cultural practices in places. In J. van Aalst, K. Thompson, M. J. Jacobson & P. Reimann (Eds.), *The future of learning: Proceedings of the 10th international conference of the learning sciences (ICLS 2012) – Volume 2, short papers, symposia, and abstracts* (pp. 326-330). Sydney, Australia: ISLS.

Penuel, W. R., Beauvineau, Y., DeBarger, A. H., Moorthy, S., & \*Allison, K. (2012). Fostering teachers' use of talk moves to promote productive participation in scientific practices. In J. van Aalst, K. Thompson, M. J. Jacobson & P. Reimann (Eds.), *The future of learning: Proceedings of the 10th International Conference of the Learning Sciences (ICLS 2012) – Volume 2, short papers, symposia, and abstracts* (Vol. 2, pp. 505-506). Sydney, Australia: ISLS.

Penuel, W. R., Moorthy, S., DeBarger, A., Beauvineau, Y., & \*Allison, K. (2012). *Tools for orchestrating productive talk in science classrooms*. Paper presented at the Workshop on Classroom Orchestration: Moving Beyond Current Understanding of the Field, at the International Conference of the Learning Sciences, Sydney, Australia. Prieto, L. P., Villagr a-Sobrino, S., Dimitriadis, Y., Schank, P., Penuel, W. R., & DeBarger, A. H. (2011, September). *Mind the gaps: Using patterns to change everyday classroom practice towards contingent CSCL teaching*. Paper presented at the Computer Supported Cooperative Learning, Hong Kong, PRC.

Penuel, W. R., Bates, L., Pasnik, S., Townsend, E., Gallagher, L. P., Llorente, C., et al. (2010). The impact of a media-rich science curriculum on low-income preschoolers' science talk at home. In K. Gomez, L. Lyons & J. Radinsky (Eds.), *Learning in the disciplines: Proceedings of the 9th International Conference of the Learning Sciences* (pp. 238-245). Chicago, IL: International Society of the Learning Sciences.

Harris, C. J., \*Phillips, R. S., & Penuel, W. R. (2010). Eliciting and developing students' ideas and questions in a learner-centered environmental biology unit. In K. Gomez, L. Lyons & J. Radinsky (Eds.), *Learning in the disciplines: Proceedings of the 9th International Conference of the Learning Sciences* (pp. 261-268). Chicago, IL: International Society of the Learning Sciences.

Penuel, W. R., Fishman, B. J., & Gallagher, L. P. (2008). The mediating role of coherence in curriculum implementation. In P. A. Kirschner (Ed.), *Proceedings of the 7th International Conference of the Learning Sciences*. Mahwah, NJ: Erlbaum.

- Rafanan, K., Roschelle, J., Bhanot, R., Gorges, T., Penuel, W. R. (2008). Measuring mathematics discourse in technology-supported collaborative activities. In P. A. Kirschner (Ed.), *Proceedings of the 7<sup>th</sup> International Conference of the Learning Sciences*. Mahwah, NJ: Erlbaum.
- Penuel, W. R., Frank, K. A., & Krause, A. (2006). The distribution of resources and expertise and the implementation of schoolwide reform initiatives. In S. A. Barab, K. E. Hay & D. T. Hickey (Eds.), *Proceedings of the 7th International Conference of the Learning Sciences* (Vol. 1, pp. 522-528). Mahwah, NJ: Erlbaum.
- Fishman, B. J., Penuel, W. R., & Yamaguchi, R. (2006). Fostering innovation implementation: Findings about supporting scale from GLOBE. In S. A. Barab, K. E. Hay & D. T. Hickey (Eds.), *Proceedings of the 7th International Conference of the Learning Sciences* (Vol. 1, pp. 168-174). Mahwah, NJ: Erlbaum.
- Roschelle, J., Penuel, W. R., & Shechtman, N. (2006). Co-design of innovations with teachers: Definition and dynamics. In S. A. Barab, K. E. Hay & D. T. Hickey (Eds.), *Proceedings of the 7th International Conference of the Learning Sciences* (Vol. 2, pp. 606-612). Mahwah, NJ: Erlbaum.
- Penuel, W. R., Roschelle, J., & Abrahamson, L. (2005). Research on classroom networks for whole-class activities. In *Proceedings of the IEEE International Workshop on Wireless and Mobile Technologies in Education* (pp. 222-229). Los Alamitos, CA: IEEE.
- Penuel, W. R., Yarnall, L., Koch, M., & Roschelle, J. (2004). Meeting teachers in the middle: Designing handheld computer-supported activities to improve student questioning. In Y. B. Kafai, W. A. Sandoval, N. Enyedy, A. S. Nixon & F. Herrera (Eds.), *Proceedings of the International Conference of the Learning Sciences* (pp. 404-411). Mahwah, NJ: Lawrence Erlbaum.
- Yarnall, L., & Penuel, W. R. (2002). Structuring group learning within a Web-based science inquiry program. In G. Stahl (Ed.), *Proceedings of the 2002 Computer Support for Collaboration Learning Conference* (pp. 577-578). Boulder, CO. University of Colorado.
- Penuel, W. R., Cole, K.A., Korbak, C. (1999). Imagination, production, and collaboration in project-based learning using multimedia. In C. Hoadley (Ed), *Proceedings of the 1999 Computer Support for Collaboration Learning Conference* (pp. 445-453). Palo Alto, CA. Stanford University.
- Penuel, W. R. & Comparini, L. (1996). The authority of narrative discourse in youth work. In J. Knuf (Ed.), *Unity and diversity: Proceedings of the 4th annual international conference on narrative*. Lexington: University of Kentucky.
- Penuel, W. R. & \*Gereme, E. (1995). Interpreting youth, interpreting ourselves: Discourse analysis in child and youth care practice. In *Proceedings of the 1994 International Conference on Child and Youth Care*. Milwaukee, Wisconsin: NOCCWA.

## **EDITED BOOKS**

Peurach, D., Russell, J., Cohen-Vogel, L., & Penuel, W. R. (Eds.). (2022). *Handbook of improvement research in education*. New York, NY: Rowman and Littlefield.

Bevan, B., & Penuel, W. R. (Eds.). (2018). *Connecting research and practice for educational improvement: Ethical and equitable approaches*. New York, NY: Routledge.

Penuel, W. R., Cole, M., & O'Neill, K. (Eds.). (2018). *Cultural-historical activity theory approaches to design-based research*. New York, NY: Routledge.

Fishman, B. J., Penuel, W. R., Allen, A.-R., & Cheng, B. H. (Eds.). (2013). *Design-based implementation research: Theories, methods, and exemplars*. *National Society for the Study of Education Yearbook*.

Penuel, W. R., & O'Connor, K. (Eds.) (2010). *Learning research as a human science*. *National Society for the Study of Education Yearbook, 109(1)*.

## **BOOKS**

Penuel, W. R., & Gallagher, D. (2017). *Creating research-practice partnerships in education*. Cambridge, MA: Harvard Education Press.

Means, B., Penuel, B., & Padilla, C. (2001). *The connected school: Technology and learning in high school*. San Francisco, CA: Jossey-Bass.

## **BOOK CHAPTERS**

Penuel, W. R., Farrell, C. C., & \*Daniel, J. (in press). Research-practice partnerships: Linking policy, practice, and research for equity. In L. Cohen-Vogel, J. Scott, & P. Youngs (Eds.), *Handbook of Education Policy Research*. Washington, DC: AERA.

Ahn, J., Van Steenis, E., & Penuel, W. R. (2022). Centering work to organize community-engaged research. In D. Peurach, J. Russell, L. Cohen-Vogel, W. R. Penuel, (Eds), *Handbook of improvement research in education* (pp. 29-46). New York, NY: Rowman and Littlefield.

Biddy, Q., \*Gendreau Chakarov, A., Jacobs, J., Penuel, W. R., Recker, M., & Sumner, T. (2022). Professional development supporting middle school teachers to integrate computational thinking into their science classes. In C. Mouza, A. Yadav & A. Leftwich (Eds.). *Preparing teachers to teach computer science: Models, practices and policies* (pp. 59-83). Information Age Publishing.

Manz, E., Heredia, S. C., Allen, C. D., & Penuel, W. R. (2022). Learning in and through researcher-teacher collaboration. In G. Jones, J. A. Luft, & T. R. Tretter (Eds.),

*MaHandbook of Research on Science Teacher Education* (pp. 452-464). New York, NY: Routledge.

Penuel, W. R., Allen, C. D., Heredia, S. C., & Manz, E. (2022). Design-Based Implementation Research as an approach to studying teacher learning in research-practice partnerships focused on equity. In A. C. Superfine, S. Goldman, M. M. Ko (Eds.), *Changing content and contexts of teacher learning: Supporting shifts in instructional practices* (pp. 217-237). New York, NY: Routledge.

Penuel, W. R., & \*Roberts, V. (2022). The theory and practice of democracy and community. In D. Peurach, J. Russell, L. Cohen-Vogel, W. R. Penuel, (Eds), *Handbook of improvement research in education* (pp. 111-130). New York, NY: Rowman and Littlefield.

Penuel, W. R., Spillane, J. P., & Sun, M. (2022). Learning sciences and policy design and implementation: A decade of mutual engagement. R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences*, 3rd Edition (pp. 638-657). New York: Cambridge University Press.

Russell, J. L. & Penuel, W. R. (2022). Introducing improvement research in education. In D. Peurach, J. Russell, L. Cohen-Vogel, & W. R. Penuel, (Eds), *Handbook of improvement research in education* (pp. 1-20). New York, NY: Rowman and Littlefield.

\*Campanella, M., & Penuel, W. R. (2021). Design-based research in educational settings: Motivations, crosscutting features, and considerations for design. In Z. Philippakos, A. Pellegrino, & E. Howell (Eds), *Design based research in education: Theory and applications* (pp. 3-22). New York, NY: Guilford Press.

Furtak, E. M., Badrinarayan, A., Penuel, W. R., Duwe, S., & Patrick-Stuart, R. (2021). Assessment of crosscutting concepts: A sensemaking perspective. In O. Lee & J. Nordine (Eds.), *Crosscutting concepts* (pp. 333-356). Washington, DC: NSTA Press.

Penuel, W. R., & Potvin, A. (2021). Design-Based Implementation Research to support inquiry learning. In C. Chinn, R. Duncan, S. Goldman, & M. Kapur (Eds.), *International Handbook of Inquiry and Learning* (pp. 74-87). Dordrecht, the Netherlands: Springer.

Penuel, W. R., Farrell, C. C., & \*Daniel, J. (2020). Supporting use of data and evidence from early warning indicator systems in research-practice partnerships. In L. Wentworth & J. Nagaoka (Eds.), *Early warning indicators in education: Innovations, uses, and optimal conditions for effectiveness*. New York, NY: Teachers College Record.

Penuel, W. R. (2020). Models of organization as cultural tools in equity-focused educational change. In N. S. Nasir, C. D. Lee, R. D. Pea, & M. McKinney De Royston (Eds.), *Handbook of the Cultural Foundations of Learning* (pp. 348-364). New York, NY: Routledge.

- Davidson, K.L. & Penuel, W.R. (2019). The role of brokers in sustaining partnership work in education. In J. Malin & C. Brown (Eds.), *The role of knowledge brokers in education: Connecting the dots between research and practice* (pp. 154-167). New York, NY: Routledge.
- Penuel, W. R. (2019). Co-design as infrastructuring with attention to power: Building collective capacity for equitable teaching and learning through Design-Based Implementation Research. In J. M. Pieters, J. M. Voogt, & N. N. P. Roblin (Eds.), *Collaborative curriculum design for sustainable innovation and teacher learning* (pp. 387-401). Dordrecht, the Netherlands: Springer.
- Peurach, D. J., Penuel, W. R., & Russell, J. L. (2019). Beyond ritualized rationality: Organizational dynamics of instructionally-focused continuous improvement. In M. Connolly, D. H. Eddy Spicer, C. James, & S. D. Kruse (Eds.), *SAGE international handbook of school organization* (pp. 465-488). Thousand Oaks, CA: SAGE.
- Penuel, W. R., \*Chang-Order, J., & Michalchik, V. (2018). Using research-practice partnerships to support interest-related learning in libraries. In V. Lee & A. L. Phillips (Ed.), *Reconceptualizing libraries: Perspectives from the information and learning sciences* (pp. 239-256). New York, NY: Routledge Press.
- Penuel, W. R., & \*DiGiacomo, D. K. (2018). Organizing for relational equity with new digital media in research-practice partnerships. In Joke Voogt, Gerald Knezek, Rhonda Christensen, and Kwok-Wing Lai (Eds.) *International Handbook of Information Technology in Primary and Secondary Education, 2<sup>nd</sup> Edition* (pp. 1-15). New York, NY: Springer.
- Allen, A.-R., & Penuel, W. R. (2018). How educational leaders see MIST: A case for long-term, mutualistic partnerships between educators and researchers. In P. Cobb, K. Jackson, E. Henrick, T. M. Smith, and the MIST Team (Eds.), *Systems for instructional improvement: Creating coherence from the classroom to the district office* (pp. 253-269). Cambridge, MA: Harvard Education Press.
- Fishman, B. J., & Penuel, W. R. (2018). Design-based implementation research. In F. Fischer, C. E. Hmelo-Silver, S. R. Goldman, & P. Reimann (Eds.), *International Handbook of the Learning Sciences*. New York, NY: Routledge.
- Penuel, W. R., \*de Los Santos, E. X., \*Lin, Q., \*Marshall, S., Anderson, C. W., & Frank, K. A. (2018). Building networks to support effective use of science curriculum materials in the *Carbon TIME* Project. In S. A. Yoon & K. Baker-Doyle (Eds.), *Networked by design: Interventions for teachers to develop social capital* (pp. 196-214) New York, NY: Routledge Press.
- Bevan, B., Penuel, W. R., Bell, P., & Buffington, P. (2018). Learning, generalizing, and local sense-making in research-practice partnerships. In B. Bevan & W. R. Penuel

- (Eds.), *Connecting research and practice for educational improvement: Ethical and equitable approaches* (pp. 18-30). New York, NY: Routledge.
- McWilliams, J., & Penuel, W. R. (2017). Queer theory in the learning sciences. In I. Esmonde & A. Booker, (Eds.), *Power and privilege in the learning sciences: Critical and sociocultural perspectives* (pp. 93-114). New York, NY: Routledge.
- Penuel, W. R., & Bevan, B. (2017). Research-practice partnerships. In K. Peppler (Ed.), *Encyclopedia of out of school learning* (Volume 2, pp. 658-661). Newbury Park, CA: Sage.
- Penuel, W. R., & \*DiGiacomo, D. (2017). Connected learning. In K. Peppler (Ed.), *Encyclopedia of out of school learning* (Volume 2, pp. 132-136). Newbury Park, CA: Sage.
- Penuel, W. R., & Shepard, L. A. (2016). Sociocognitive and sociocultural models of assessment. In A. Rupp & J. P. Leighton (Eds.), *Cognitive Models of Assessment* (pp. 146-173). New York: Wiley.
- Penuel, W. R., & DeBarger, A. H. (2016). A research-practice partnership to improve formative assessment in science. In A. Daly & K. S. Finnigan (Eds.), *Thinking systemically: Improving districts under pressure* (pp. 97-118). Washington, DC: American Educational Research Association.
- Penuel, W. R., & Shepard, L. A. (2016). Teaching and assessment. In D. Gitomer & C. Bell (Eds.), *Handbook of Research on Teaching* (pp. 787-851). Washington, DC: AERA.
- Sabelli, N., Penuel, W. R., & Cheng, B. (2015). The role of informatics in education research and policy. In E. W. Johnston (Ed.), *Governance in the information era: Theory and practice of policy informatics* (pp. 213-228). New York, NY: Routledge.
- Penuel, W. R., & Spillane, J. P. (2014). Learning sciences and policy design and implementation: Key tools and concepts for collaborative engagement. K. Sawyer (Ed.), *Cambridge Handbook of the Learning Sciences, 2<sup>nd</sup> Edition* (pp. 649-667). New York: Cambridge University Press.
- Penuel, W. R., & Coburn, C. E. (2014). Introduction to Part 1: Research use at the school and district level. In K. S. Finnigan & A. J. Daly (Eds.), *Using research evidence in education: From the schoolhouse door to Capitol Hill* (pp. 9-13). New York, NY: Springer.
- Fishman, B. J., Penuel, W. R., Allen, A.-R., Cheng, B. H., & Sabelli, N. (2013). Design-based implementation research: An emerging model for transforming the relationship of research and practice. In B. J. Fishman, W. R. Penuel, A.-R. Allen & B. H. Cheng (Eds.), *Design-based implementation research: Theories, methods, and exemplars. National Society for the Study of Education Yearbook* (pp. 136-156). New York, NY: Teachers College Record.

- Penuel, W. R., Coburn, C. E., & Gallagher, D. (2013). Negotiating problems of practice in research-practice partnerships focused on design. In B. J. Fishman, W. R. Penuel, A.-R. Allen & B. H. Cheng (Eds.), *Design-based implementation research: Theories, methods, and exemplars. National Society for the Study of Education Yearbook* (pp. 237-255). New York, NY: Teachers College Record.
- Penuel, W. R., Frank, K. A., Sun, M., & Kim, C. M. (2012). Teachers' social capital and the implementation of schoolwide reforms. In S. Kelly (Ed.), *Assessing teacher quality: Understanding teacher effects on instruction and achievement* (pp. 183-200). New York: Teachers College Press.
- DeBarger, A., Penuel, W. R., Harris, C. J., & Schank, P. (2010). Teaching routines to enhance collaboration using classroom network technology. In F. Pozzi & D. Persico (Eds.), *Techniques for fostering collaboration in online learning communities: Theoretical and practical perspectives* (pp. 222-244). Hershey, PA: IGI Global.
- Penuel, W. R., Frank, K. A., & Krause, A. (2010). Between leaders and teachers: Using social network analysis to examine the effects of distributed leadership. In A. J. Daly (Ed.), *Social network theory and educational change* (pp. 159-178). Cambridge, MA: Harvard University Press.
- Penuel, W. R. (2010). Classroom uses of technology to manage instruction. *International Encyclopedia of Education*, 8, 133-139.
- Penuel, W. R. (2010). A dialogical epistemology for educational evaluation. In W. R. Penuel & K. O'Connor (Eds.), *Learning research as a human science. National Society for the Study of Education Yearbook*, 109(1), 128-143.
- Penuel, W. R., & O'Connor, K. (2010). Learning research as a human science: Old wine in new bottles? In W. R. Penuel & K. O'Connor (Eds.), *Learning research as a human science. National Society for the Study of Education Yearbook*, 109(1), 268-283.
- O'Connor, K. & Penuel, W. R. (2010). Introduction. In W. R. Penuel & K. O'Connor (Eds.), *Learning research as a human science. National Society for the Study of Education Yearbook*, 109(1), 1-16.
- Penuel, W. R. (2010). Implementation and effects of 1:1 computing initiatives: A research synthesis. In L. Schrum (Ed.), *Considerations on technology and teachers: The best of JTRTE* (Vol. 38, pp. 329-348). Washington, DC: International Society for Technology in Education.
- Penuel, W. R. (2008). Making the most of one-to-one computing in networked classrooms. In J. Voogt & G. Knezek (Eds.), *International handbook of information technology in primary and secondary education* (pp. 925-931). Dordrecht: Springer.
- Crawford, V. M., Schlager, M. S., Penuel, W. R., & Toyama, Y. (2008). Supporting the art of teaching in a data-rich, high-performance learning environment. In E. B.

- Mandinach & M. Honey (Eds.), *Data-driven school improvement: Linking data and learning* (pp. 109-129). New York: Teachers College Press.
- Haertel, G. D., Means, B., & Penuel, W. R. (2007). Technology tools for collecting, managing, and using assessment data to inform instruction and improve achievement. In L. Smoulin, K. Lawless, & N. C. Burbules (Eds.), *Information and communication technologies: Considerations of current practice for teachers and teacher educators. National Society for the Study of Education Yearbook, 106* (2), 103-132.
- Penuel, W. R., Lynn, E., & Berger, L. (2006). Classroom assessment with handheld computers. In M. van 't Hooft & K. Swan (Eds.), *Ubiquitous computing in education: Invisible technology, visible impact* (pp. 103-125). Mahwah, NJ: Erlbaum.
- Penuel, W. R., Abrahamson, A. L., & Roschelle, J. (2006). Theorizing the transformed classroom: A sociocultural interpretation of the effects of audience response systems in higher education. In D. Banks (Ed.), *Audience response systems in higher education: Applications and cases* (pp. 187-208). Hershey, PA: Information Science Publishing.
- Means, B., & Penuel, W. R. (2005). Research to support scaling up technology-based educational innovations. In C. Dede, J. P. Honan & L. C. Peters (Eds.), *Scaling up success: Lessons from technology-based educational improvement* (pp. 176-197). San Francisco, CA: Jossey-Bass.
- Mislevy, R. J., Steinberg, L. S., Almond, R. G., Haertel, G. D., & Penuel, W. R. (2003). Improving educational assessment. In B. Means & G. D. Haertel (Eds.), *Evaluating educational technology: Effective research designs for improving learning.* (pp. 149-180). New York: Teachers College Press.
- Penuel, B., & Cohen, A. (2002). Coming to the crossroads of knowledge, learning, and technology: Integrating knowledge management and workplace learning. In M. Ackerman, V. Pipek, & V. Wulf (Ed.), *Sharing expertise: Beyond knowledge management* (pp. 57-76). Cambridge, MA: MIT Press.
- Means, B., Penuel, W. R., & Quelmallz, E. (2001). Developing assessments for tomorrow's classrooms. In W. Heinecke, & L. Blasi, (Eds.), *Research methods for educational technology. Volume 1: Methods of evaluating educational technology.* Greenwich, CT: Information Age Publishing.
- Penuel, W. R., & Davey, T.L. (2000). Meeting the educational needs of homeless teens. In J.H. Stronge & E. Reed-Victor (Eds.), *Educating homeless students: Promising practices* (pp. 63-78). Larchmont, NY: Eye on Education.
- Penuel, W. R. (1998). Vygotsky, Bakhtin, and identity formation: Sociocultural approaches to youth empowerment. In R. Bernhardt, C.N. Hedley, G. Cattaro, & V. Svolopoulos (Eds.), *Curriculum leadership: Redefining schools in the 21st century* (pp.153-176). Cresskill, NJ: Hampton Press.

Penuel, W. R. & Wertsch, J.V. (1998). Historical representation as mediated action: Official history as a tool. In J. F. Voss & M. Carretero, (Eds.), *Learning and reasoning in history* (pp. 23-38). Portland, OR: Woburn Press.

Wertsch, J.V. & Penuel, W. R. (1995). The individual-society antinomy revisited: Productive tensions in theories of development, communication, and education. In D.R. Olson & N.R. Torrance (Eds.), *Handbook of education and human development: New models of learning, teaching, and schooling* (pp. 399-416). New York: Basil Blackwell.

## **SELECTED TECHNICAL REPORTS AND COMMISSIONED PAPERS**

Henrick, E., Farrell, C. C., Singleton, C., Resnick, A. F., Penuel, W. R., Arce-Trigatti, P., Schmidt, D., Sexton, S., Stamatis, K., & \*Wellberg, S. (2023). *Indicators of research-practice partnership health and effectiveness: Updating the five dimensions framework*. National Network of Educational Research-Practice Partnerships and National Center for Research in Policy and Practice. <https://bpb-us-e1.wpmucdn.com/blogs.rice.edu/dist/0/6401/files/2023/12/RPP-Health-and-Effectiveness-Framework-2023.pdf>

Chang, M. A., Philip, T. M., Cortez, A., \*McKoy, A., Sumner, T., & Penuel, W. R. (2022). Engaging youth in envisioning artificial intelligence in classrooms: Lessons learned. *Rapid Community Report Series*. Digital Promise and the International Society of the Learning Sciences. <https://repository.isls.org/handle/1/7670>

Marshall, S. L., & Penuel, W. R. (2021). *Envisioning beyond zip codes and boundaries: The systemic work needed to actualize equitable science education for all*. Commissioned paper of the National Academies of Sciences, Engineering, and Medicine.

Farrell, C. C., Penuel, W. R., \*Daniel, J., \*Steup, L., & Coburn, C. E. (2021). *Research-practice partnerships in education: The state of the field*. Boulder, CO: National Center for Research in Policy and Practice, University of Colorado Boulder. Available at: <http://wtgrantfoundation.org/research-practice-partnerships-in-education-the-state-of-the-field>

Penuel, W. R., Soland, J., Farrell, C. C., Davidson, K., & Arce-Trigatti, P. (2021). *Assessing the outcomes of research-practice partnerships: An evaluation argument*. Boulder, CO: National Center for Research in Policy and Practice.

Penuel, W. R., Farrell, C. C., Anderson, E. R., Coburn, C. E., Allen, A.-R., \*Bohannon, A. X., Hopkins, M., Brown, S. (2020). *A comparative, descriptive study of three research-practice partnerships: Goals, activities, and influence on district policy, practice, and decision making*. Boulder, CO: National Center for Research in Policy and Practice.

Ito, M., Arum, R., Conley, D., Gutierrez, K. D., Kirshner, B., Livingstone, S., Michalchik, V., Penuel, W. R., Peppler, K. A., Pinkard, N., Rhodes, J., Teninbas,

- K. S., Schor, J., Sefton-Green, J., & Watkins, S. C. (2020). *The Connected Learning Research Network: Reflections on a decade of engaged scholarship*. Irvine, CA: Connected Learning Alliance, University of California, Irvine.
- Weis, L., Eisenhart, M., Duncan, G. J., Albro, E., Bueschel, A. C., Cobb, P., Eccles, J., Mendenhall, R., Moss, P., Penuel, W. R., Ream, R. K. Rumbaut, R. G., Sloane, F., Weisner, T. S., & Wilson, J. (2019). Report: Mixed methods for studies that address broad and enduring issues in education research. *Teachers College Record*, 121, 1-16.
- Farrell, C. C., Davidson, K. L., \*Repko-Erwin, M., Penuel, W. R., \*Quantz, M., \*Wong, H., \*Riedy, R., \*Brink, Z. (2018). *A descriptive study of the IES researcher-practitioner partnerships in education research program*. Boulder, CO: National Center for Research in Policy and Practice.
- Penuel, W. R., & Reiser, B. J. (2018). *Designing NGSS-aligned curriculum materials*. Paper developed for the Board on Science Education for the revision to America's Lab Report. Boulder, CO and Evanston, IL: University of Colorado Boulder and Northwestern University.
- Penuel, W. R., Peurach, D. J., LeBoeuf, W. A., \*Riedy, R., Barber, M., Clark, T. R., & Gabriele, K. (2017). *Defining collaborative problem solving research: Common values and distinctive approaches*. White paper developed for the Spencer Foundation. Boulder, CO: University of Colorado.
- Henrick, E. C., Cobb, P., Penuel, W. R., Jackson, K., & Clark, T. R. (2017). *Assessing research-practice partnerships: Five dimensions of effectiveness*. New York, NY: William T. Grant Foundation.
- Farrell, C. C., Davidson, K. L., \*Repko-Erwin, M., Penuel, W. R., Herlihy, C., \*Potvin, A. S., & Hill, H. C. (2017). *A descriptive study of the IES Researcher-Practitioner Partnerships in Education Program*. Boulder, CO: National Center for Research in Policy and Practice.
- Penuel, W. R., Briggs, D. C., Davidson, K. L., Herlihy, C., \*Sherer, D., Hill, H. C., Farrell, Caitlin C., Allen, A.-R. (2016). *Findings from a national survey of research use among school and district leaders*. Boulder, CO: National Center for Research in Policy and Practice.
- Harris, C. J., Penuel, W. R., D'Angelo, C., DeBarger, A., & Gallagher, L. P. (2014). *Curriculum materials make a difference for next generation science learning: Results from Year 1 of a randomized controlled trial*. Menlo Park, CA and Boulder, CO: SRI International and University of Colorado.
- Penuel, W. R., Lee, T. R., & Bevan, B. (2014). *Designing for equitable learning across settings*. San Francisco, CA: Exploratorium.

- Coburn, C. E., Penuel, W. R., & Geil, K. (2013). *Research-practice partnerships at the district level: A new strategy for leveraging research for educational improvement*. Berkeley, CA and Boulder, CO: University of California and University of Colorado.
- Anderson, C. W., Cobb, P., Calabrese Barton, A., Confrey, J., Penuel, W. R., & Schauble, L. (2012). *Learning progressions footprint conference final report*. East Lansing, MI: Michigan State University.
- Penuel, W. R., & McGhee, R. (2010). *21st Century Community Learning Centers: Descriptive study of program practices*. Menlo Park, CA: SRI International.
- Penuel, W. R., Pasnik, S., Bates, L., Townsend, E., Gallagher, L. P., Llorente, C., et al. (2009). *Preschool teachers can use a media-rich curriculum to prepare low-income children for school success: Results of a randomized controlled trial*. New York, NY and Menlo Park, CA: Education Development Center, Inc. and SRI International.
- Gallagher, H. A., Penuel, W. R., Murphy, R. F., Bosetti, K. R., Shields, P. M., Toyama, Y., et al. (2009). *National Evaluation of Writing Project professional development: Year 2 report*. Menlo Park, CA: SRI International.
- Penuel, W. R., Ferguson, K., Singleton, C., Shea, S., Borelli, K., & Korbak, C. (2008). *MathForward implementation quality report*. Menlo Park, CA: SRI International.
- Gallagher, H. A., Penuel, W. R., Shields, P. M., & Bosetti, K. R. (2007). *National evaluation of writing professional development: Year 1 report to the National Writing Project (NWP)*. Menlo Park, CA: SRI International.
- Pasnik, S., Strother, S., Schindel, J., Penuel, W. R., & Llorente, C. (2007). *Report to the Ready To Learn initiative: Review of research on media and young children's literacy*. New York, NY and Menlo Park, CA: Education Development Center and SRI International.
- Dynarski, M., Agodini, R., Heaviside, S., Carey, N., Campuzano, L., Means, B., Murphy, R., Penuel, W. R., Javitz, H., Emery, D. K., & Sussex, W. (2007). *Effectiveness of reading and mathematics software products: Findings from the first student cohort*. Washington, DC: Institute of Education Sciences, U.S. Department of Education.
- Penuel, W. R., Frank, K. A., & Sussex, W. (2007). *Report from a workshop: Research exchange on teacher networks*. Menlo Park, CA: SRI International.
- Penuel, W. R., Bienkowski, M., Gallagher, L., Korbak, C., Sussex, W., Yamaguchi, R., Fishman, B. J. (2006). *GLOBE Year 10 evaluation: Into the next generation*. Menlo Park, CA: SRI International.
- Penuel, W. R., Bienkowski, M., Korbak, C., Molina, A., Russo, D., Toyama, Y., et al. (2005). *GLOBE Year 9 evaluation: Implementation supports and student outcomes*. Menlo Park, CA: SRI International.

- Bienkowski, M., Penuel, W., Toyama, Y., Molina, A., Hurst, K., & Peck-Theis, L. (2005). *JASON Academy summative program evaluation: Final report*. Menlo Park, CA: SRI International.
- Penuel, W. R., Roschelle, J., Crawford, V., Shechtman, N., & Abrahamson, A. L. (2004). *Workshop report: Advancing research on the transformative potential of interactive pedagogies and classroom networks*. Menlo Park, CA: SRI International.
- Penuel, W. R., Phillips, M., Toyama, Y., Vahey, P., Hafter, A., & Peck-Theis, L. (2004). *Mathemagica summative program evaluation: Final report*. Menlo Park, CA: SRI International.
- Penuel, W. R., Korbak, C., Yarnall, L., Lewis, A., Toyama, Y., & Zander, M. (2004). *GLOBE Year 8 Evaluation: Understanding diverse implementation contexts*. Menlo Park, CA: SRI International.
- Roschelle, J., Abrahamson, A. L., & Penuel, W. R. (2003). *CATAALYST: Towards scientific studies of the strategic integration of learning theory and classroom network technology to improve teaching and learning*. Menlo Park, CA: SRI International.
- Penuel, W. R., Korbak, C., Lewis, A., Shear, L., Toyama, Y., & Yarnall, L. (2002). *GLOBE Year 7 evaluation: Exploring student research and inquiry in GLOBE*. Menlo Park, CA: SRI International.
- Korbak, C., Penuel, W. R., Kim, D., Cole, K. A., Daniels, M., Gillespie, M., et al. (2002). *Community Technology Centers Program outcome evaluation: Summary of findings from Annual Performance Reports of FY99 and FY00 grantees*. Menlo Park, CA: SRI International.
- Penuel, W. R., Kim, D. Y., Michalchik, V., Lewis, S., Means, B., Murphy, B., et al. (2001). *Using technology to enhance connections between home and school: A research synthesis*. Menlo Park, CA: SRI International.
- Penuel, W. R., Michalchik, V., Daniels, M., Jennings, P., Stites, R., Yarnall, L., Hawkins, K., Pacpaco, R., & Kim, D. Y. (2001). *Community technology centers case study report: Learning with technology in six communities*. Report submitted to the U.S. Department of Education. Menlo Park, CA: SRI International.
- Murphy, R., Penuel, W. R., Means, B., Korbak, C., & Whaley, A. (2001). *E-DESK: A review of recent evidence on the effectiveness of discrete educational software*. Menlo Park, CA: SRI International.
- Penuel, W. R., Korbak, C., Daniels, M., Kim, D. Y., Yarnall, L., Hawkins, J., & Pacpaco, R. (2000). *Community technology centers program findings summary: A review of FY99 grantees' annual performance reports*. Report submitted to the U.S. Department of Education. Menlo Park, CA: SRI International.

Penuel, W. R., Golan, S., Means, B., & Korbak, C. (2000). *Silicon Valley Challenge 2000: Year 4 report*. Report submitted to the San Mateo County Office of Education. Menlo Park, CA: SRI International.

## **POLICY GUIDES, BRIEFS, AND REVIEWS**

\*Brown, D., & Penuel, W. R. (2023). *Making the most of teacher team time to support equitable assessment*. Public Scholarship Collaborative Policy Brief. Stanford Graduate School of Education.

Hmelo-Silver, C., Barron, B. J., Coté, N., Hickey, D., Lin, X., Nathan, M., O'Mahoney, K., Pea, R., Penuel, W. R., Roschelle, J., Sabelli, N., Schwartz, D., Sharp, D., & Varma, K. (2023). The adventures of John Bransford: In memoriam. *Journal of the Learning Sciences*. <https://doi.org/10.1080/10508406.2023.2219202>

Penuel, W. R. (2023). What researchers need to know and do to create and maintain partnerships: A response to Dr. McGeown. *Psychology of Education Review*, 47 (1), 15-18.

Bang, M., Bricker, L., Darling-Hammond, L., Edgerton, A. K., Grossman, P., Gutiérrez, K. D., Ishimaru, A. M., Klevan, S., Lee, C. D., Miyashiro, D., Nasir, N. S., Noguera, P. A., Payne, C., Penuel, W. R., Plasencia, S., & Vossoughi, S. (2021). *Summer learning and beyond: Opportunities for creating equity*. Chicago, IL and Palo Alto, CA: Spencer Foundation and Learning Policy Institute.

Penuel, W. R. (2020, May 21). *The new normal could be better than the old one. A learning scientist explains why*. Boulder, CO: National Education Policy Center.

Shepard, L. A., Diaz-Bilello, E., Penuel, W. R., & Marion, S. F. (2020). *Classroom assessment principles to support teaching and learning*. Boulder, CO: Center for Assessment, Design, Research and Evaluation, University of Colorado Boulder.

Penuel, W. R., Allen, A.-R., & Finnigan, K. S. (2017). *How research-practice partnerships can support ESSA implementation for educational improvement and equity: A guide for school districts, state education leaders, and researchers*. Boulder, CO: Research+Practice Collaboratory.

Penuel, W. R. (2017). *A research-practice partnership can help your state implement its ESSA plans*. Boulder, CO: Research+Practice Collaboratory.

Penuel, W. R., Bell, P., Neill, T., & Shaw, S. (2016). *Why a vision for a coherent, equitable system of state science education?* Boulder, CO: ACESSE Project.

Penuel, W. R., Meyer, E. J., & Valladares, M. R. (2016). *Making the most out of the Every Student Succeeds Act: Helping states focus on school equity, quality, and climate*. Boulder, CO: National Education Policy Center.

Penuel, W. R., & Johnson, R. (2016). *Review of Continued Progress: Promising evidence on personalized learning*. Boulder, CO: National Education Policy Center.

## **MAGAZINE ARTICLES**

D'Mello, S. K., Bidy, Q., Breideband, T., Bush, J. B., Chang, M. A., Cortez, A., Flanigan, J., Foltz, P. W., Gorman, J. C., Hirshfield, L. M., Ko, M.-L. M., Krishnaswamy, N., Lieber, R., Martin, J., Palmer, M. S., Penuel, W. R., Walker, L., & Whitehill, J. (under review). From learning optimization to learner flourishing: Reimagining AI in education at the Institute for Student-AI Teaming (iSAT). *AI Magazine*.

Watkins, D. A., & Penuel, W. R. (2023). Learning to co-design instructional materials for scale and spread. *NNERPP Extra* 5 (3), 2-10.

Penuel, W. R. (2021). Possible futures for equitable educational assessment. *Phi Delta Kappan*, 103(4), 54-57. <https://doi.org/10.1177/00317217211065829>

Coburn, C. E., Penuel, W. R., & Farrell, C. C. (2021). Fostering educational improvement with research-practice partnerships. *Phi Delta Kappan*, 102 (7), 14-19.

Penuel, W. R., Bell, P., & Neill, T. (2020). Creating a system of professional learning that meets teachers' needs. *Phi Delta Kappan*, 101(8), 37-41.

Henrick, E., McGee, S., & Penuel, W. R. (2019). Attending to issues of equity in evaluating research-practice partnership outcomes. *NNERPP Extra*, 1(3), 8-13. <http://nnerppextra.rice.edu/attending-to-issues-of-equity-in-evaluating-rpps/>

\*Widman, S., \*Chang-Order, J., Penuel, W. R., & Wortman, A. (2019). Using evaluation tools toward more equitable youth engagement in libraries: Measuring connected learning and beyond. *Young Adult Library Services*, 17(4), 36-44.

Taylor, J., Thomas, L., Penuel, W. R., & Sullivan, S. (2019). Food fight! Students taking a bite out of climate change at school. *The Science Teacher*, 87 (1), 42-48.

Shepard, L. A., Penuel, W. R., & Davidson, K. (2017). Using formative assessment to create coherent and equitable assessment systems. *Phi Delta Kappan*, 98 (6), 47-52.

Penuel, W. R., Harris, C. J., & DeBarger, A. H. (2015). Implementing the *Next Generation Science Standards*. *Phi Delta Kappan*, 96 (6), 45-49.

Penuel, W. R., (2008). Preparing teachers to teach for deep understanding: A curriculum-based approach. *The Earth Scientist*, 27 (2). 21-24.

- Penuel, W. R., & Riel, M. (2007). The new science of networks and the challenge of school change. *Phi Delta Kappan*, 88 (8), 611-615.
- Penuel, W. R. (2005). Implementing a handheld program: Lessons from a district-level initiative. *Learning and Leading with Technology*, 32 (6), 2-6.
- Roschelle, J., Penuel, W. R., & Abrahamson, A. L. (2004). The networked classroom. *Educational Leadership*, 61 (5), 50-54.
- Penuel, W. R., Korbak, C., & Cole, K. A. (2002). Designing assessments for student multimedia projects. *Learning and Leading with Technology*, 29, 46-53.
- Penuel, W. R. (2001). Designs for learning: Structuring opportunity in community technology centers. Retrieved June 4, 2004, from <http://www.techsoup.org/howto/articlepage.cfm?ArticleId=331&topicid=12>
- Penuel, W. R., Yarnall, L., & Simkins, M. B. (2000, Sept./Oct.). Do technology investments pay off? The evidence is in! *Leadership*, 30(1): 18-19.
- Penuel, W. R., Means, B., & Simkins, M. B. (2000). The multimedia challenge. *Educational Leadership*, 58, 34-38.

## **BOOK REVIEWS AND COMMENTARY**

- Penuel, W. R. (2021, May 17). Effective science learning means observing and explaining. There's a curriculum for that. *EducationWeek*. <https://www.edweek.org/teaching-learning/opinion-effective-science-learning-means-observing-and-explaining-theres-a-curriculum-for-that/2021/05>
- Penuel, W. R., & Schultz, K. (2021, March 25). A better way to make sense of pandemic 'learning loss.' *Washington Post*. <https://www.washingtonpost.com/education/2021/03/25/a-better-way-to-look-at-pandemic-learning-loss/>
- Furtak, E. M., Shepard, L. A., Penuel, W. R. (2021, March 5). Going forth with standardized tests may cause more problems than it solves. *The Conversation*. <https://theconversation.com/going-forth-with-standardized-tests-may-cause-more-problems-than-it-solves-155231>
- Penuel, W. R. (2020). Commentary: To promote equity, prepare students for what science could be. *NSTA Reports*.
- Penuel, W. R., & Furtak, E. M. (2019). Science-as-practice and the status of knowledge: A response to Osborne. *Science Education*, 103 (6), 1367-1395.

Penuel, W. R. (2016). Review of *Learning to Improve: How America's Schools Can Get Better at Getting Better*, by Anthony S. Bryk, Louis Gomez, Alicia Grunow, and Paul LeMahieu. *Science Education*, 100 (4), 777-779.

Penuel, W. R. (2011). Review of *Research and Practice in Education: Building Alliances, Bridging the Divide*, by Cynthia Coburn and Mary Kay Stein. *Teachers College Record*.

Penuel, W. R. (2000). Little faith: A book review of *Ordinary resurrections: Children in the Years of Hope*, by Jonathan Kozol. City Limits. Available online at: [www.citylimits.org/content/articles/viewarticle.cfm?article\\_id=2602](http://www.citylimits.org/content/articles/viewarticle.cfm?article_id=2602).

Crawford, V. M., & Penuel, W. R. (1997). Review of *The Dialogical Self. Mind, Culture, and Activity*.

## **BLOG POSTS**

Penuel, W. R. (2022, October). Looking back and looking forward at implementation of the *Framework's* vision for equitable science teaching. Retrieved from: <https://www.nsta.org/blog/school-district-and-state-implementation-next-generation-science-standards>.

Penuel, W. R. (2021, November). How do education leaders access and use research evidence [Blog post]. Retrieved from: <https://ies.ed.gov/blogs/research/post/how-do-education-leaders-access-and-use-research-evidence>

Penuel, W. R. (2016, October 18). Research that leaders really use, researchers they want close by [Blog post]. Retrieved from: <http://researchandpractice.org/research-that-leaders-really-use>

Penuel, W. R. (2016, October 17). The Every Student Succeeds Act (ESSA): What it means for research-practice partnerships. Retrieved from: <http://researchandpractice.org/essa-and-partnerships>.

Penuel, W. R., & Allen, A. R. (2016, May 12). To study conceptual use of research, consider tradeoffs among methods [Blog post]. Retrieved from: <http://wtgrantfoundation.org/study-conceptual-use-research-consider-tradeoffs-among-methods>

Penuel, W. R. (2015, December 10). What will research use look like under the Every Student Succeeds Act [Blog post]. Retrieved from: <http://ncrpp.org/blog/2015/what-will-research-use-look-like-under-the-every-student-succeeds-act>

Penuel, W. R., & Shea, M. (2015, July 8). Negotiating the focus of joint work in a partnership [Blog post]. Retrieved from: <http://researchandpractice.org/jointly-negotiating-a-problem-of-practice>.

## **TOOLS AND MATERIALS FOR TEACHERS AND EDUCATION LEADERS**

Badrinarayan, A., Penuel, W. R., Fishman, B. J., & Cooper, S. (2023). *Criteria for an equitable grading system*. <https://contextus.science/resources/resource-title-1-zdaw5-np3xd>

Heinz, M., Inouye, M. C., Krenek, C., Allen, L., Mead, T., & Penuel, W. R., (2022). *ACESSE Resource H — Attending to Student Interests and Community Priorities in Phenomena*. Available at: <https://stemteachingtools.org/pd/sessionh>.

Penuel, W. R., Carlson, C. E., Wachowski, S., Freitas, D., Alvarez, A., Hamilton, R., Schild, A., & \*Raza, A. (2022). *Steps to designing justice-focused assessments in science*. Available at: <http://stemteachingtools.org/brief/83>.

Penuel, W.R., Wingert, K. Patton, R., Mayer, K., DeGregori, L., Reed, W., Biddy, Q., & Underwood, J. (2021). *How should we search for life beyond Earth?* [Unit 1 in the inquiryHub Chemistry curriculum]. Boulder, CO: inquiryHub Research+Practice Partnership.

Penuel, W.R., Wingert, K. Patton, R., Blue, M., Evans, S., Leventhal, A., Dolph, A., Lindsay, W., & Youmans, J. (2021). *How could a small amount of nuclear material power an entire city but also destroy it? Should we use it?* [Unit 4 in the inquiryHub Chemistry curriculum]. Boulder, CO: inquiryHub Research+Practice Partnership.

Allen, A.-R., Wortman, A., \*Widman, S., Michalchik, V., & Penuel, W. R. (2020). *Partnering with Future Ready with the library*. Connected Learning Alliance.

inquiryHub Research+Practice Partnership, OpenSciEd, Charles A. Dana Center. *Fostering productive norms in remote teaching*. (2020). Authors. Available at: <https://www.openscienced.org/wp-content/uploads/2020/03/Resources-for-Remote-Teaching-Norms.pdf>

inquiryHub Research+Practice Partnership, OpenSciEd, Charles A. Dana Center. *Leading an Anchoring Phenomenon Routine in remote teaching*. (2020). Authors. Available at: <https://www.openscienced.org/wp-content/uploads/2020/04/TCHR-Resources-for-Remote-Teaching-Anchoring-Phenomenon-Routine.pdf>

inquiryHub Research+Practice Partnership, OpenSciEd, Charles A. Dana Center. *Using the Navigation Routine while teaching remotely*. (2020). Authors. <https://www.openscienced.org/wp-content/uploads/2020/04/Resources-for-Remote-Teaching-Navigation-Routine.pdf>

- inquiryHub Research+Practice Partnership, OpenSciEd, Charles A. Dana Center. *Supporting discourse while teaching remotely*. (2020). Authors. <https://www.openscienced.org/wp-content/uploads/2020/04/Resources-for-Remote-Teaching-Discourse.pdf>
- inquiryHub Research+Practice Partnership, OpenSciEd, Charles A. Dana Center. *Using the Problematizing Routine while teaching remotely*. (2020). Authors. <https://www.openscienced.org/wp-content/uploads/2020/04/Resources-for-Remote-Teaching-Problematizing.pdf>
- Penuel, W. R., Bell, P., Neill, T., Morrison, D., & Tesoriero, G. (2018). *ACESSE Resource E: Selecting compelling anchoring phenomena for equitable science teaching*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/pd/sessione>.
- Bell, P., Stromholt, S., Penuel, W. R., Van Horne, K., Neill, T., Shaw, S. (2017). *ACESSE Resource A: Introduction to formative assessment to support equitable 3D instruction*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/pd/sessiona>.
- Bell, P., Stromholt, S., Van Horne, K., Penuel, W. R., Neill, T., Shaw, S. (2017). *How to assess three-dimensional learning in your classroom: Building assessment tasks that work*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/pd/sessionb>.
- Penuel, W. R., Novak, M., McGill, T., Van Horne, K., & Reiser, B. J. (2017). *How to define meaningful daily learning objectives for science investigations*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/46>.
- Bell, P., Van Horne, K., & Penuel, W. R. (2016). *How can assessments be designed to engage students in the range of science and engineering practices?* Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/26>.
- Northwestern University and Inquiry Hub Partnership team. (2016-2018). *Why don't antibiotics work the way they used to: A next generation science storyline*. Available at: <http://www.nextgenstorylines.org/why-dont-antibiotics-work-like-they-used-to>.
- Penuel, W. R., Allen, A.-R., Clark, T. R., & Ciplet, J. (2016). *The research-practice partnership toolkit*. Boulder, CO: Research+Practice Collaboratory. Available at: <http://researchandpractice.org/toolkit/>.
- Penuel, W. R., & Van Horne, K. (2016). *Prompts for integrating crosscutting concepts into assessment and instruction*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/41>.
- Penuel, W. R., & Bell, P. (2016). *Qualities of a good anchor phenomenon for a coherent sequence of science lessons*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/28>.

Van Horne, K., Penuel, W. R., & Bell, P. (2016). *Integrating science practices into assessment tasks*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/30>.

Penuel, W. R., Van Horne, K., & Bell, P. (2016). *Steps to designing a three dimensional assessment*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/29>.

\*Cafarella, J., & Penuel, W. R. (2015). *Research brief: Supporting teacher professional communities to implement school-wide initiatives*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/24>.

Cook-Endres, T., Taylor, A., & Penuel, W. R. (2014). *Using curriculum adaptation as a strategy to help teachers learn about NGSS and developing aligned instructional materials*. Seattle, WA: University of Washington. Available at: <http://stemteachingtools.org/brief/5>.

## **INVITED PRESENTATIONS**

Penuel, W. R. (2023, December). *Partnering with rural teachers to design science assessment tasks*. Presentation to the Northeast and Islands Regional Education Laboratory. [online]

Penuel, W. R. (2023, October). *Research-practice partnerships: Organizing for joint work toward equity and justice*. Presentation to the Racial and Social Justice Research-Practice Partnership Collaborative at the University of Maryland, College Park, MD.

Bell, W. R., Penuel, W. R., Bang, M., & Tzou, C. (2023, June). *Co-designing in partnership as a strategy for supporting justice in STEM education*. DRK-12 (NSF) Principal Investigators Meeting, Washington, DC.

Penuel, W. R. (2022, November). *Codiseño de tecnología para aumentar la inteligencia humana: Un enfoque democrático para promover la equidad a través de las TICs*. Invited keynote at EDUTECH 2022 Palma XXV Congreso Internacional.

Penuel, W. R., & Watkins, D. (2022, September). *Partnering to promote equity through formative assessment*. Invited presentation to Spencer Foundation meeting on research-practice partnerships.

Penuel, W. R. (2022, June). *Infrastructuring and knowledge building*. Invited speaker for workshop on infrastructuring at International Society for the Learning Sciences (virtual).

Shepard, L. A., & Penuel, W. R. (2022, March). *A vision for equitable assessment grounded in curriculum*. Invited presentation to the Science Performance Assessment Learning Collaborative.

- Penuel, W. R. (2021, November). *Principios de aprendizaje equitativo postpandemia*. Invited keynote at the International Conference of Research in Education. Salamanca, Spain. Talk available at: <https://youtu.be/9N0WfUnVzoE>
- Penuel, W. R. (2021, July). *Engaging students in addressing community priorities and global matters of concern through justice-focused design projects*. National Science Education Leadership Association Summer Leadership Institute. [virtual]
- Penuel, W. R. (2021, May). *Centering the perspectives of nondominant groups and communities in designing and supporting meaningful science experiences*. University of Oslo, Oslo, Norway. [virtual]
- Penuel, W. R. (2021, March). *Expanding design research to transform learning across settings*. Keynote presentation at the ICO International Spring School 2020, Rolduc Abbey, Kerkrade, the Netherlands. [virtual]
- Penuel, W. R. (2020, January) *Introduction to Design-Based Implementation Research*. Invited presentation to the Wheelock College of Education and Human Development, Boston University, Boston, MA.
- Penuel, W. R. (2020, January). *Introduction to Research-Practice Partnerships*. Invited presentation to the Wheelock College of Education and Human Development, Boston University, Boston, MA.
- Penuel, W. R. (2020, January). *Implementation Research in DBIR*. Invited presentation to the Wheelock College of Education and Human Development, Boston University, Boston, MA.
- Penuel, W. R. (2019, November). *Building equitable research-practice partnerships*. Invited presentation at the Simmons School of Education and Human Development, Southern Methodist University. Dallas, TX.
- Penuel, W.R., & Bruno, J. (2019, April). *Developing and supporting research-practice partnerships (RPPs)*. Invited presentation to the Annual Conference of the Council of State Science Supervisors. St. Louis, MO.
- Penuel, W. R. (2019, February). *Introduction to Design-Based Implementation Research*. Invited presentation to the Learning Sciences Research Institute, University of Illinois-Chicago. Chicago, IL.
- Penuel, W. R. (2019, January). *Introduction to Design-Based Implementation Research*. Invited presentation to the McKay School of Education, Brigham Young University. Provo, Utah.
- Penuel, W. R. (2018, November). *Making Science Learning Meaning for All Students, or Why “All Means All” Requires Getting to Know Student Interests, Experiences, and Identities*. Keynote at the Kentucky Science Teachers Association. Lexington, KY.

- Penuel, W. R., (2018, July). *Connected learning*. Invited presentation to the Bofill Foundation, Barcelona, Catalonia, Spain.
- Penuel, W. R. (2018, June). *Connecting science curriculum to students' interests and identities*. Invited presentation at the University of Barcelona, Catalonia, Spain.
- Penuel, W. R. (2018, March). *Building an equitable and coherent system of assessments in a district: A partnership approach*. Annual Marzano Lecture, Rutgers University, New Brunswick, NJ.
- Penuel, W. R. (2018, January). *Strengthening infrastructures for promoting equity in mathematics education through research-practice partnerships*. Presentation to the Joint Mathematics Meetings, San Diego, CA.
- Penuel, W. R. (2017, November). *Research-practice partnerships as a strategy for developing and using evidence in policy and practice*. Invited presentation at the Dean's Lecture Series, University of Sydney School of Education and Social Work, Sydney, Australia.
- Penuel, W. R., & Watkins, D. (2017, June). *Developing capacity through curricular co-design*. Invited presentation to the Board on Science Education, National Academies, Washington, DC.
- Penuel, W. R. (2017, April). *Building capacity through developing and supporting new curriculum materials in a research-practice partnership*. Invited presentation to the Center for Science Teaching and Learning at Northern Arizona University.
- Penuel, W. R. (2017, March). *Design-based implementation research*. Invited presentation at the Carnegie Foundation for the Advancement of Teaching Improvement Summit, San Francisco, CA.
- Penuel, W. R. (2017, March). *Selecting anchoring phenomena for equitable science teaching and learning*. Invited workshop for the Colorado Science Education Network, Boulder, CO.
- Shepard, L., & Penuel, W. R. (2017, February). *Deepening formative assessment practice*. Invited address to the FAST and Science SCAS of the Council of Chief State School Officers, New Orleans, LA.
- Penuel, W. R., & Bevan, B. (2017, January). *Developing research-practice partnerships*. Invited workshop series to teams developing proposals for NSF solicitation, "Computer Science for All: Research-Practice Partnerships), Atlanta, GA, Los Angeles, CA, and Chicago, IL.
- Penuel, W. R. (2016, November). *Designing and building infrastructures to support equitable STEM learning across settings*. Invited keynote address at the Bridging Learning Experiences Conference, Barcelona, Catalonia, Spain.

- Penuel, W. R. (2016, October). *Mapping research questions and program elements in partnership research*. Invited talk at the White House Office of Science and Technology Policy, Washington, DC.
- Penuel, W. R. (2016, October). *Design-Based Implementation Research*. Invited talk to the Institute for School Partnership, Washington University, St. Louis, MO.
- Penuel, W. R. (2016, May). *'Infrastructuring' as a practice for promoting equity and transformation in design-based implementation research*. Invited talk given at the Friday Institute for Educational Innovation, Raleigh, NC.
- Penuel, W. R. (2016, April). *Getting to scale with equitable teaching and learning*. Presidential Session at the American Educational Research Association Meeting, Washington, DC.
- Penuel, W. R., Bell, P. L., Briggs, D. C., Buffington, P. J., Coburn, C. E., Farley-Ripple, E. N., Hill, H. C., May, H., & Spillane, J. P. (2016, April). *Reconceptualizing how we study and support research use*. Invited Panel at the American Educational Research Association Meeting, Washington, DC.
- Penuel, W. R. (2015, October). *Getting to scale with new visions of teaching and learning*. Paper presented at the Using Continuous Improvement to Integrating Design, Implementation, and Scale Up, Nashville, TN.
- Penuel, W. R. (2015, September). *'Infrastructuring' as a practice for promoting equity and transformation in design-based implementation research*. Paper presented at the International Society for Design and Development in Education (ISDDE) 15, Boulder, CO.
- Penuel, W. R. (2015, May). *Design-Based Implementation Research: An introductory workshop*. Presentation given at the University of Girona. Girona, Catalonia, Spain: University of Girona.
- Penuel, W. R., & Martin, C. (2015, April). *Design-Based Implementation Research as a strategy for expanding opportunity to learn in school districts*. Invited presentation to the Research Conference of the National Council of Teachers of Mathematics, Boston, MA.
- Penuel, W. R. (2014, December). *Getting to scale and sustainability with design-based implementation research*. Invited presentation to Board on Science Education, National Academies, Irvine, CA.
- Penuel, W. R. (2014, December). *Preparing teachers to support three-dimensional science learning*. Invited presentation at "Sharing the Adventure with the Student: Exploring the Intersections of NASA Space Science and Education, A Workshop." National Academy of Sciences, Washington, DC.

- Penuel, W. R. (2014, November). *Developing assessments for the Next Generation Science Standards*. Invited presentation and workshop for the Colorado Front Range Science Supervisors, Denver, CO.
- Penuel, W. R., Shea, M. V., Frost, F., & Gallagher, D. (2014, October). *Strategies for negotiating problems of practice with partners*. Invited presentation to the Math-Science Partnership Conference, Washington, DC.
- Penuel, W. R. (2014, October). *Assessment and the Next Generation Science Standards*. Invited presentation and workshop for the Colorado Science Education Network, Boulder, CO.
- Penuel, W. R. (2014, September). *Supporting instructional shifts in the Next Generation Science Standards*. Invited presentation and workshop for the Colorado Front Range Science Supervisors, Denver, CO.
- Penuel, W. R., \*Heredia, S., Rigby, J., & Russell, J. (2014, August). *Fidelity and beyond: Developing and using implementation evidence in research and development projects*. Invited symposium at the National Science Foundation's DRK-12 Principal Investigators Meeting.
- Penuel, W. R. (2014, June). *Research-based models for professional development*. Invited presentation to Building State Capacity in State Science Education Meeting, Denver, CO.
- Shouse, A., & Penuel, W. R. (2014, June). *Adapting instructional models to NGSS practices: What needs to be done to reach all learners?* Invited presentation to Building State Capacity in State Science Education Meeting, Denver, CO.
- Penuel, W. R., & McLaren, P. (2014, April). *Developing assessments of science proficiency: Recommendations of NRC Report*. Invited presentation to Council of State Science Supervisors Annual Conference, Boston, MA.
- Penuel, W. R. (2014, February). *Studying and supporting interest development*. Invited presentation as part of CREATE speaker series, Michigan State University, East Lansing, MI.
- Penuel, W. R., Falk, J., & Dierking, L. (2013, December). *The Synergies Agent-Based Model: Preliminary work, challenges, and opportunities*. Invited presentation to the Seoul National University, Seoul, South Korea.
- Penuel, W. R., & Fishman, B. J. (2013, November). *Design-Based Implementation Research: Working in partnership to transform the relation of research and practice*. Webinar presented through MSP Net to the NSF Math and Science Partnership community.
- Penuel, W. R. (2013, October). *Developing and using implementation evidence in research and development efforts*. National Science Foundation, Washington, DC.

Penuel, W. R. (2013, September). *Improving implementation of innovative teaching practices: From fidelity to principled adaptation of curricula*. Invited presentation at the University of Twente, the Netherlands.

DeBarger, W. R., Penuel, W. R., & Harris, C. H. (2013, September). *Designing NGSS assessments to evaluate the efficacy of curriculum interventions*. Invited presentation for the Joint meeting of the Council of Chief State School Officers and the State Collaborative on Assessment and Student Standards, Washington, DC.

Penuel, W. R. (2013, August). *Introduction to the Next Generation Science Standards*. Invited presentation to the Boulder Valley School District, Boulder, CO.

Penuel, W. R. (2013, August). *Designing for change in complex educational systems*. Invited presentation to Waterbury Summit, Pennsylvania State University, State College, PA.

Penuel, W. R. (2013, July). *Design-Based Implementation Research: Working in partnership(s) to transform the relation of research and practice*. Paper presented at the Maine Physical Science Partnership, University of Maine, Bangor, ME.

Penuel, W. R., & Fishman, B. J. (2013, May). *Design-Based Implementation Research: Working in partnership to transform the relation of research and practice*. Presentation to the Northwestern University Multidisciplinary Program in Education Sciences, Evanston, IL.

Penuel, W. R. (2013, April). *Research, development, and assessment with badges: An equity and diversity perspective*. Presentation at the STEM Badges: Current Terrain and Beyond Meeting, National Science Foundation, Arlington, Virginia.

Penuel, W. R. (2013, March). *Digital media and learning in early childhood*. Invited presentation to the National Center for Quality Teaching and Learning, University of Washington, Seattle, WA.

Penuel, W. R. (2012, September). *Planning for change: Issues of implementation and scale*. Keynote address presented at the Nevada STEM Smart Workshop, Las Vegas, NV.

Penuel, W. R. (2009, January). *Organizing, leading, and sustaining innovation in professional learning communities*. Keynote address presented at the Microsoft Innovative Schools Conference, London, England.

## **SELECTED RECENT PRESENTATIONS**

Bell, P., Penuel, W. R., Morrison, D. L., & Neill, T. (2023, October). *Promoting equity by systematically noticing and responding to learning experiences through practical measures*. Workshop presented at the National Science Teaching Association National Meeting, Kansas City, MO.

- Penuel, W. R. (2023, October). *Developing storylines from a compelling anchor*. Workshop presented at the National Science Teaching Association National Meeting, Kansas City, MO.
- Penuel, W. R., & Bell, P. (2023, October). *How to design justice-focused 3D assessments in science*. Workshop presented at the National Science Teaching Association National Meeting, Kansas City, MO.
- Penuel, W. R., & Neill, T. (2023, October). *Adapting Open Education Resources (OER) instructional materials to connect to local phenomena and priorities*. Workshop presented at the National Science Teaching Association National Meeting, Kansas City, MO.
- Penuel, W. R., & Neill, T. (2023, October). *Selecting anchoring phenomena for equitable 3D teaching*. Workshop presented at the National Science Teaching Association National Meeting, Kansas City, MO.
- Penuel, W. R., Bell, P., Bang, M., & Tzou, C. (2023, June). *Solidarity-based codesign for equity and justice in STEM education*. Workshop at the NSF DRK12 Principal Investigators Meeting, Alexandria, VA.
- \*Campanella, M., & Penuel, W. R. (2023, April). *The meeting as a site for deepening and sustaining commitment and action for racial justice*. Poster presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Penuel, W. R. (2023, April). *iSAT: Using responsible innovation to build and test an AI partner for collaborative learning*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Penuel, W. R., Allen, C. D., Manz, E., & Heredia, S. (2023, April). *Design-Based Implementation Research as an approach to studying teacher learning in research-practice partnerships focused on equity*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- \*Raza, A., Penuel, W. R., Li, J., & Frank, K. A. (2023, April). *Using student experience data in a collaborative inquiry cycle to support equity in the science classroom*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- \*Riedy, R., & Penuel, W. R. (2023, April). *Dignity-affirming care in research-practice partnerships*. Poster presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Penuel, W. R., Diaz-Bilello, E., & Rosa, R. (2023, April). *We need curriculum-linked classroom assessments focused on learning*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

- Penuel, W. R., Krumm, A. E., Pazera, C., \*Singleton, C. A., Allen, A-R., & \*Deverel-Rico, C. (2023, April). *Belonging in science classrooms: Investigating its relation to students' contributions and influence in knowledge building*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Penuel, W. R., Potvin, A. S., & Van Steenis, E. (2023, April). *Supporting educators in organizing for compassionate schools*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Henson, K., Penuel, W. R., Buck-Bracey, Z., & Vick, N. (2023, March). *Introducing OpenSciEd High School*. Professional Learning Institute presented at the National Science Teaching Association National Meeting, Atlanta, GA.
- Lo, A., Penuel, W. R., & Wingert, K. (2022, April). *Supporting teachers in designing assessments aligned to the vision of the Framework: Findings from two design studies*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.
- Potvin, A., Penuel, W. R., & Dimidjian, S. (2022, April). *Supporting educators; development in skillful application of compassion in schools through collaborative design*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.
- Penuel, W. R., & \*Riedy, R. (2022, April). *Whose commons? Answerable to whom and to what?* Panel presentation at the Annual Meeting of the American Educational Research Association, San Diego, CA.
- Rhinehart, A., & Penuel, W. R. (2022, April). *How actors throughout the network of science education would change their state systems*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.
- \*Ceperich, R., \*Tran, T., \*Salinas del Val, Y., & Penuel, W. R. (2022, April). *Science education leaders' sensemaking and noticing for equity*. Paper presented at NARST International Conference, Vancouver, BC.
- \*Deverel-Rico, C., Allen, A.-R., Penuel, W. R., & Pazera, C. (2022, April). *Learning to teach with storylines*. Paper presented at NARST International Conference, Vancouver, BC.
- \*Raza, A., Penuel, W. R., \*Salinas del Val, Y. (2022, April). *Supporting science teachers in using student experience data to support more equitable participation in science classrooms*. Paper presented at NARST International Conference, Vancouver, BC.
- Peurach, D., Russell, J. L., Penuel, W. R., Eddy-Spicer, D., Datnow, A., Cannata, M., Cohen-Vogel, L., & Daly, A. (2021, April). *Introducing the foundational handbook on improvement research in education*. 2-21 Carnegie Foundation Summit on Improvement in Education, virtual.

- Farrell, C. C., Penuel, W. R., Davidson, K. L., Arce-Trigatti, P., & Soland, J. (2021, April). *Assessing the effectiveness of research-practice partnerships: An evidence-centered design approach*. Paper presented at the Annual Meeting of the American Educational Research Association. [virtual]
- Penuel, W. R., Wingert, K., Curran, A., Warrior, D., & Sidler, E. (2021, April). *Co-created learning: Interest surveys and content dissemination*. Paper presented at the Annual Meeting of the American Educational Research Association. [virtual]
- Rhinehart, A., \*Arada, K., Penuel, W. R., & \*Garcia, M. M. (2021, April). *How state leaders would change their state systems of science education*. Paper presented at the NARST Annual Meeting, virtual.
- Farrell, C. C., & Penuel, W. R. (2020, April). *Methodological trade-offs for research-practice partnership evaluation*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. [Conference cancelled]
- Farrell, C. C., Penuel, W. R., \*Daniel, J., \*Steup, J., & Coburn, C. E. (2020, April). *Research-practice partnerships: Current practices, future possibilities*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. [Conference cancelled]
- Penuel, W. R., Raza, A., Watkins, D. A., Allen, A., Sumner, T. (2020, April). *Measuring and supporting student experiences in biology classrooms: Design tensions in assessing interest and identity dimensions of science learning*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. [Conference cancelled]
- Wingert, K., & Penuel, W. R., Urbano-Torres, A. (2020, April). *Power, pollution and particles: Designing a youth-led chemistry curriculum*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA. [Conference cancelled]
- Biddy, Q., \*Gendreau Chakarov, A., Sumner, T., Recker, M., & Penuel, W. R. (2020, January). *Integrating computational thinking into middle school science through co-designed storylines*. Paper presented at the Association for Science Teacher Education International Conference, San Antonio, TX.
- Alzen, J., Penuel, W. R., Reiser, B. J., & Passmore, C. (2019, March). *What goes into facilitating purposeful sensemaking in the classroom? Theorizing about teacher learning*. Paper presented at the NARST International Conference, Baltimore, MD.
- Kali, Y., Van Horne, K., \*Watkins, D., Jacobs, J., & Penuel, W. R. (2019, April). *Ethical dilemmas and deliberative dialogue as means for increasing students' science capital: A World Café-inspired design*. Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, Ontario, Canada.

- Morrison, D., \*Riedy, R., & Penuel, W. R. (2019, March). Practical measures to sense and support states' implementation efforts of science education reform. Paper presented at the NARST International Conference, Baltimore, MD.
- Penuel, W. R., (2019, March). *Viewing collective activism through the lenses of critical science education research*. Paper presented at the NARST International Conference, Baltimore, MD.
- Penuel, W. R., Lo, A., Jacobs, J., Stuhlsatz, M., Wilson, C., & Van Horne, K. (2019, March). *Tools for supporting teachers to build quality 3D assessment tasks*. Paper presented at the NARST International Conference, Baltimore, MD.
- \*Riedy, R., \*Tesoriero, G., & Penuel, W. R. (2019, April). *Understanding the vision for science in Next Generation Science Standards adopting and nonadopting states*. Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, Ontario, Canada.
- \*Widman, S., \*Repko-Erwin, M., & Penuel, W. R. (2019, April). *Negotiating mutualism: A comparative case study of researchers and practitioners collaboratively scaling STE(A)M education initiatives*. Paper presented at the Annual Meeting of the American Educational Research Association, Toronto, Ontario, Canada.
- Penuel, W. R., \*Frumin, K., Van Horne, K., & Jacobs, J. (2018, April). *A phenomenon-based assessment system for three-dimensional science standards: Why do we need it and what can it look like in practice?* Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.
- Penuel, W. R., Reiser, B. J., Novak, M., McGill, T., \*Frumin, K., Van Horne, K., Sumner, T., & \*Watkins, D. A. (2018, April). *Using co-design to test and refine a model for three-dimensional science curriculum that connects to students' interests and experiences*. Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.
- Penuel, W. R., Van Horne, K., Jacobs, J., & \*Turner, M. (2018, April). *Developing a validity argument for practical measures of student experience in project-based science classrooms*. Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.
- Penuel, W. R., Van Horne, K., Jacobs, J., Sumner, T., Watkins, D., & \*Quigley, D. (2017). *Developing NGSS-aligned curriculum that connects to students' interests and experiences: Lessons learned from a co-design partnership*. Paper presented at the NARST Annual Conference, San Antonio, TX.
- Weidler-Lewis, J., Penuel, W. R., & Van Horne, K. (2017, April). *Developing a measure of teachers' vision for equitable science teaching and learning*. Paper presented at the NARST Annual Conference, San Antonio, TX.

- D'Angelo, C., Moorthy, S., \*Allen, C. D., Harris, C. D., Penuel, W. R. (2016, April). *Exploring variation in curriculum implementation through data visualization of teacher talk*. Paper presented at the 2016 NARST International Conference, Baltimore, MD.
- \*Severance, S., Penuel, W. R., Manz, E. I., & Leary, H. A. (2016, April). *Teacher learning of modeling practices in the NGSS across professional development and classroom settings*. Paper presented at the 2016 NARST International Conference, Baltimore, MD.
- Pinkard, N., Penuel, W. R., \*Dibie, O., \*Sultan, A. M., \*Quigley, D., Sumner, T., Van Horne, K., Acholonu, U. (2016, April). *Mapping and modeling the abundance, diversity, and accessibility of summer learning opportunities at the scale of a city*. Paper presented at the American Educational Research Association Annual Meeting, Washington, D. C.
- Penuel, W. R., \*Severance, S., Reiser, B. J., Kincaid, P., Miller, J., Yacoubian, J., Martin, C., & Leary, H. (2015, April). *Curriculum co-design as a strategy for supporting equitable implementation of Next Generation Science Standards*. Paper to be presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Penuel, W. R., Falk, J., Dierking, L., Hendry, M., Harrison, J., & Staus, N. (2015, April). *Using agent-based modeling to gain insight into interest development*. Paper to be presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- Penuel, W. R., Harris, C. J., D'Angelo, C., Gallagher, L. P., Cheng, B. H., Moorthy, S., & Krajcik, J. (2015, April). *Supporting next generation science teaching and learning with curriculum materials: Results from an efficacy study*. Paper to be presented at NARST Annual Conference, Chicago, IL.
- \*Cafarella, J., Penuel, W. R., Staus, N., \*Wyld, J., \*Bailey, D., Dierking, L., & Falk, J. (2015, April). *Investigating complementary approaches to measuring interest in science*. Paper to be presented at NARST Annual Conference, Chicago, IL.
- \*Cartun, A., & Penuel, W. R. (2015, April). *Youth voices on sponsorship of literacy in an emerging participatory culture in a school setting*. Paper to be presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.
- \*Severance, S., \*Allen, C., & Penuel, W. R. (2015, April). *Leveraging professional development to design and enact NGSS-aligned materials in uncertain policy contexts*. Paper to be presented at NARST Annual Conference, Chicago, IL.
- Penuel, W. R., Bevan, B., Bell, P., Buffington, P., & Falk, J. (2014, April). *Using social network concepts to enhance research use in planning for educational change*. Paper presented in Presidential Session of the Annual Meeting of the American Educational Research Association, Philadelphia, PA.

- Penuel, W. R., & Otero, V. (2014, April). *Design-Based Implementation Research for improving undergraduate STEM education*. Paper presented in Presidential Session of the Annual Meeting of the American Educational Research Association, Philadelphia, PA.
- Maul, A., Penuel, W. R., \*Dadey, N., Gallagher, L. P., Podkul, T., & Sauerteig, D. (2014, April). *Emerging validity evidence for a survey measure of connected learning*. Paper presented at the Annual Meeting of the American Educational Research Association, Philadelphia, PA.
- \*Allen, C., Penuel, W. R., & D'Angelo, C. (2014, March). *Beyond content and standards knowledge: Examining systemic coherence through teacher sensemaking for the successful implementation of the Next Generation Science Standards*. Paper presented at the NARST Annual Meeting, Pittsburgh, PA.
- Penuel, W. R. (2013, April). *The change laboratory as a method of design-based research*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Penuel, W. R. (2013, April). *Theorizing science learning in practice*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Penuel, W. R., Llorente, C., Van Brunt, J., & Drummond, M. (2013, April). *Synthesis of recent literature on technology and media for early literacy learning*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Penuel, W. R., Sun, M., Frank, K. A., & Gallagher, H. A. (2013, April). *Using social network analysis to study how collegial interactions can augment teacher learning from external professional development*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, CA.
- Penuel, W. R., DeBarger, A., Kim, C. B., Moorthy, S., Beauvineau, Y., Kennedy, C. A., . . . \*Allison, K. (2013, April). *Improving learning by improving classroom assessment in Earth science: Findings from the Contingent Pedagogies project*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, San Juan, PR.
- Penuel, W. R., \*York, A. J., Kirshner, B., Falk, J. H., Dierking, L. D., Haun-Frank, J., . . . \*Bailey, D. (2012, April). *Youth participatory research as a boundary practice in place-based partnerships for expanding learning opportunities in communities*. Paper presented at the Annual Meeting of the American Educational Research Association, Vancouver, BC.
- Penuel, W. R., & Means, B. (2010, November). *Using large-scale databases in evaluation: Advances, opportunities, and challenges*. Paper presented at the Annual Meeting of the American Evaluation Association, San Antonio, TX.

Penuel, W. R. (2010, October). *Leveraging student interest and choice in designs for STEM learning in formal and informal contexts*. Paper presented at the Principal Investigators Meeting of the National Science Foundation's Science of Learning Centers, Arlington, VA.

Stevens, R., & Penuel, W. R. (2010, October). *Studying and fostering learning through joint media engagement*. Paper presented at the Principal Investigators Meeting of the National Science Foundation's Science of Learning Centers, Arlington, VA.

Penuel, W. R. (2010, September). *The role of intra-organizational processes in mediating institutional diffusion*. Paper presented as part of the IES Lecture Series at the University of Pennsylvania, Philadelphia, PA.

Penuel, W. R., Frank, K. A., Sun, M., Kim, C., & Singleton, C. (2010, August). *The role of intra-organizational processes in mediating institutional diffusion*. Paper presented at the Annual Meeting of the American Sociological Association, Atlanta, GA.

Penuel, W. R., Cheng, B., Harris, C. J., & Phillips, R. (2010, April). *Translating design principles into practice: A comparative case study of three design-based research projects in the LIFE Center*. Paper presented at the Annual Meeting of the American Educational Research Association, Denver, CO.

Penuel, W. R., Bates, L., Townsend, E., Gallagher, L. P., Pasnik, S., & Llorente, C. (2010, March). *A media-rich curriculum for improving early literacy outcomes of low-income children: Evaluation results for the Ready to Learn Initiative*. Paper presented at the Annual Conference of the Society for Research on Effectiveness in Education, Washington, DC.

\*Phillips, R. S., Harris, C. J., Penuel, W. R., & Cheng, B. (2010, March). *Teachers managing students' ideas, questions, and contributions in the context of an innovative inquiry-based elementary science unit*. Paper presented at the Annual Meeting of the National Association for Research in Science Teaching, Philadelphia, PA.

Gallagher, L. & Penuel, W. R. (2009, April). *Preparing teachers to design instruction in middle school Earth science: Impacts of three professional development programs on student learning*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Penuel, W. R. (2009, April). *Evaluating the DELTA Project*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

O'Connor, K., & Penuel, W. R. (2009, April). *Organizing as a metaphor for learning and research on learning*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Fishman, B. J., Penuel, W. R., Hegedus, S. J., Tatar, D., Dickey, M., Moniz, R., et al. (2009, April). *What happens when the research ends? Factors related to the sustainability and*

*scalability of a research-based innovation*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Penuel, W. R. (2009, January). *Organizing, leading, and sustaining innovation in professional learning communities*. Keynote Presentation at the Microsoft Innovative Schools Conference, London, England.

Fishman, B. J., Penuel, W. R., Gallagher, L. P., Lopez-Prado, B., & Korbak, C. (2008, June). *The mediating role of coherence in curriculum implementation*. Paper presented at the 8th International Conference of the Learning Sciences, Utrecht, the Netherlands.

Rafanan, K., Roschelle, J., Bhanot, R., Gorges, T., & Penuel, W. R. (2008, June). *Measuring mathematics discourse in technology-supported collaborative activities*. Paper presented at the 8th International Conference of the Learning Sciences, Utrecht, the Netherlands.

Penuel, W. R., & Gallagher, L. P. (2008, March). *Comparing three approaches to preparing teachers to teach for deep understanding in Earth science: Short-term impacts on teachers' instructional planning and practice*. Paper presented at the Annual Meeting of the American Educational Research Association, New York, NY.

Penuel, W. R., McWilliams, H., & McAuliffe, C. (2007, December). *Investigating the role of the teacher in science curriculum: New evidence for an old debate*. Paper presented at the American Geophysical Union Fall Meeting 2007, San Francisco, CA.

Penuel, W. R., Riel, M., Frank, K. A., & Krause, A. (2007, April). *Teacher networks and the diffusion of innovations*. Paper presented at the 4th Lake Arrowhead Conference on Human Complex Systems, Lake Arrowhead, CA.

\*Joshi, A., & Penuel, W. R. (2007, April). *The role of institutionalized norms of autonomy and equality in shaping interactions of teachers*. Paper presented at the 4th Lake Arrowhead Conference on Human Complex Systems, Lake Arrowhead, CA.

Penuel, W. R., Riel, M., & Sussex, W. (2007, April). *A network perspective on teacher collaboration: Teachers' social capital and the enactment of curricular reforms*. Paper presented at the American Educational Research Association Annual Meeting, Chicago, IL.

Penuel, W. R., Frank, K. A., & Krause, A. (2007, April). *A social network approach to examining the effects of distributed leadership in schoolwide reform initiatives*. Paper presented at the American Educational Research Association Annual Meeting, Chicago, IL.

Penuel, W. R., Frank, K. A., & Riel, M. (2007, February). *Instructional change and improved achievement: The significance of the internal social structure of schools*. Paper presented at the Conference on Human and Social Capital in Learning Systems, Pittsburgh, PA.

Penuel, W. R., Kreikemeier, P., Venezky, D. Y., Blank, J. G., Davatzes, A. E. K., & Davatzes, N. C. (2006, December). *Assessing teachers' comprehension of what matters in*

*Earth science*. Paper presented at the American Geophysical Union Fall Meeting 2006, San Francisco, CA.

Penuel, W. R., Sussex, W., & Korbak, C. (2005, October). *Mapping the distribution of expertise and resources in a school: A social capital approach to evaluating school capacity*. Paper presented at the Joint Conference of the Canadian Evaluation Society and the American Evaluation Association, Toronto, Ontario.

Penuel, W. R., & Sussex, W. (2005, August). *GLOBE Year 10 evaluation results*. Paper presented at the 10th Annual GLOBE Conference, Prague, Czech Republic.

Penuel, W. R., Riel, M., Korbak, C., & Means, B. (2004, April). *Investigation of a social capital approach to the adoption of reform practices*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Penuel, W. R., Shear, L., Korbak, C., & Sparrow, E. (2004, April). *The roles of regional partners in supporting an international science inquiry program*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Yarnall, L., & Penuel, W. R. (2004, April). *Designing handheld software to support classroom assessment*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Penuel, W. R., & Means, B. (2004, February). *The effectiveness of technology-supported science education: Studying what works how, when, and for whom*. Paper presented at the Annual Meeting of the American Association for the Advancement of Science, Seattle, WA.

## **RECORD OF EXTERNAL FUNDING FOR RESEARCH**

*As Principal Investigator or Project Director*

2022-2023	“OpenSciEd High School Professional Development” \$200,000 Funder: Carnegie Corporation of New York
2021-2022	“Science Performance Assessment Learning Collaborative: Initiative for Curriculum-Embedded Assessment” \$132,250 Funder: Learning Policy Institute
2021-2024	“OpenSciEd High School Developers Consortium: Supporting Equity and Building Capacity through Collaborative Science Curriculum” \$7,800,000 Funder: Carnegie Corporation of New York

2020-2024	<p>“Preparing Teachers to Design Tasks to Support, Engage, and Assess Science Learning in Rural Schools”</p> <p>\$2,999,000</p> <p>Funder: National Science Foundation</p>
2020-2023	<p>“Collaborative Research: EMBEDS: Exploring the Mathematics of Biological Ecosystems with Data Science”</p> <p>\$200,000</p> <p>Funder: National Science Foundation</p>
2018-2021	<p>“Deepening Learning through Culturally Relevant Phenomenon-Based Science Teaching”</p> <p>\$1,000,000</p> <p>Supplement for 2018: \$409,000</p> <p>Funder: Hewlett Foundation</p>
2017-2021	<p>“Building Capacity for Using Data on Student Experience as Formative Assessment (SEFA) to Promote Equitable Instruction”</p> <p>\$400,000</p> <p>Funder: Spencer Foundation</p>
2017-2020	<p>“EAGER: Examining an Innovative Approach to Supporting Science Teachers Practice towards Three-Dimensional Learning Goals through Adapting Classroom Assessment Tasks”</p> <p>\$299,837</p> <p>Funder: National Science Foundation</p>
2017-2018	<p>“Developing a Typology of Continuous Improvement Research in Education”</p> <p>\$75,000</p> <p>Funder: Spencer Foundation</p>
2016-2018	<p>“EAGER: Smart and Connected Communities: Reducing Friction in the L3 Connects Infrastructure: Embedding a Recommender System into Mobile Apps to Support Real-time Brokering”</p> <p>\$189,988</p> <p>Funder: National Science Foundation</p>
2016-2019	<p>“Partnership for Building Capacity for Improvement in State Science Education”</p> <p>\$ 1,499,998</p> <p>Funder: National Science Foundation</p>
2014-2018	<p>“National Center for Research in Policy and Practice”</p>

\$4,995,000  
Funder: Institute of Education Sciences, U.S. Department of Education

2012-2017 “Connected Learning Research Network Survey Study”  
\$729,295  
Funder: MacArthur Foundation

2011-2012 “Developing and Testing Theories of Implementation: A  
Workshop on Design Research with Educational Systems”  
\$184,779  
Funder: REESE Program, National Science Foundation

2010-2015 “Evaluation of the Ready to Learn Content Alliance”  
\$4,874,999  
Funder: Office of Innovation and Improvement, U.S.  
Department of Education

2008-2012 “Developing Contingent Pedagogies: Integrating Technology-  
Enhanced Feedback into a Middle School Science  
Curriculum to Improve Conceptual Teaching and Learning”  
\$2,199,970  
Funder: DRK-12 Program, National Science Foundation

2007-2009 “Evaluation of the MathForward Initiative”  
\$728,000  
Funder: Texas Instruments, Inc.

2006-2010 “Evaluation of the Ready to Learn Initiative”  
\$2,070,000  
Funder: Office of Innovation and Improvement, U.S.  
Department of Education

2006-2009 “Analyzing the Flow of Network-Embedded Expertise in  
Schools: A Longitudinal Study of Individual and  
Organizational Change”  
\$551,484  
Funder: Human and Social Dynamics Program, National  
Science Foundation

2005-2009 “Comparing the Efficacy of Three Approaches to  
Transforming Instruction in Earth Science Education”  
\$1,864,415  
Funder: Institute of Education Sciences, U.S. Department of  
Education

2004-2008	<p>“21<sup>st</sup> Century Community Learning Centers Program Implementation Study”          \$1,642,462          Funder: Program and Policy Studies Service, U.S. Department of Education</p>
2003-2007	<p>“Evaluation of the Global Learning to Benefit the Environment (GLOBE) Program: A Systemic Approach.”          \$910,659          Funder: Elementary, Secondary, and Informal Education, National Science Foundation</p>
2003-2007	<p>“Exploration of a Social Capital Framework for Evaluative Studies of Technology Integration”          \$1,346,733          Funder: ROLE, National Science Foundation</p>
2003-2005	<p>“Evaluation of the <i>Routes to Learning</i> Initiative”          \$75,000          Funder: Koret Foundation</p>
2002-2005	<p>“Handheld Assessment: Portable Scaffolds for Project-based Learning in Science?”          \$ 1,822,042          Funder: ROLE, National Science Foundation</p>

*As Co-Principal Investigator*

2023-2025	<p>“Embedding Research into Organizational Routines to Deepen the Use of Evidence”          Funder: William T. Grant Foundation          \$600,000</p>
2020-2024	<p>“Developing a Model of Teacher Learning to Support Computationally Rich Communication in Science Classrooms”          Funder: James S. McDonnell Foundation          \$2,499,702</p>
2019-2021	<p>“Advancing Coherent and Equitable Systems of Science Education: Supporting Middle Schools”          Funder: Bill and Melinda Gates Foundation          \$152,238</p>
2019-2024	<p>“Advancing Coherent and Equitable Systems of Science Education”</p>

	Funder: National Science Foundation \$2,500,000
2019-2023	“Measuring the Effectiveness of Research-Practice Partnerships in Education” Funder: William T. Grant Foundation \$635,337
2018-2020	“Research-Practice Partnerships White Paper 2.0” Funders: William T. Grant Foundation and Spencer Foundation \$125,000
2018-2023	“Developing a Model of Teacher Learning to Support Classroom Enactment of Three-Dimensional Science Teaching” Funder: James S. McDonnell Foundation \$5,000,000 (CU Portion: \$203,428)
2017-2020	“Collaborative Research: Using a School-Based Sensing Platform and Targeted Teacher Professional Development to Support Computational Thinking Integration and Student Learning” Funder: National Science Foundation \$2,123,801
2016-2019	“Capturing Connected Learning in Libraries” \$772,864 Funder: Institute of Museum and Library Services
2016-2017	“EAGER: Early Stage Research on Automatically Identifying Instructional Moves in Mathematics” \$299,928 Funder: National Science Foundation
2015-2017	“Curriculum Units That Exemplify Three Dimensional Learning and Assessment” \$ 834,528 Funder: Gordon & Betty Moore Foundation
2013-2018	“A Research+Practice Collaboratory” \$1,441,305 Funder: National Science Foundation
2012-2016	“INDP: Inquiry Hub” \$1,520,531 Funder: National Science Foundation

2012-2016	“From Users to Coproducers of Research Evidence: A Study of Place-Based Research Partnerships” \$591,901 Funder: William T. Grant Foundation
2011-2015	“Synergies: Understanding and Connecting STEM Learning in the Community” \$601,177 Funder: Noyce Foundation
2010-2015	“Efficacy Trial of Project Based Inquiry Science” \$5,000,000 Funder: National Science Foundation
2006-2011	“Evaluation of the National Writing Project” \$5,000,000 Funder: U.S. Department of Education
2003-2005	“The CATAALYST - Planning a Rigorous Study” \$231,607 Funder: National Science Foundation

## **PATENTS**

*Method and Apparatus for Group Learning via Sequential Explanation Templates*  
US8092227 B2  
January 10, 2012

## **EXTERNAL PROFESSIONAL SERVICE**

2021-present	Editorial Board member, <i>Educational Researcher</i>
2021-present	Member, committee for Equity in PreK-12 STEM Education, National Academies of Sciences, Engineering, and Medicine
2020-present	Member, NAEd/Spencer Postdoctoral Fellowship Review Committee (Chair in 2022)
2018-present	Member, Board on Science Education (BOSE), National Academies of Sciences, Engineering, and Medicine
2018-present	Editorial Board member, <i>the Journal of the Learning Sciences</i>
2016-present	Ad hoc reviewer, Spencer Foundation grants
2014-present	Editorial Board member, <i>Mind, Culture, Activity</i>

2014-2018	Standing review panel member, Institute of Education Sciences, <i>Researcher-Practitioner Partnerships Program</i>
2007-present	Editorial Board Member, <i>Teachers College Record</i>
2007-2018	Regular reviewer, <i>Sociology of Education</i>
2010-2017	Editorial Board Member, <i>American Journal of Evaluation</i>
2012-2016	Advisory board member, Building Capacity for State Science Education Initiative, Council of State Science Supervisors
2008-2015	Editorial Board Member, <i>Cognition &amp; Instruction</i>
2014	Reviewer, National Science Foundation DRK-12 program
2012-2014	Conference co-chair, 11 <sup>th</sup> International Conference of the Learning Sciences
2012-2013	Member, National Research Council committee on Assessment and the Next Generation Science Standards
2011-2013	Member, Geographical Sciences Education Research Committee
2011-2013	Member, Geographical Sciences Education Research Committee
2011-2013	Associate Editor, <i>American Educational Research Journal</i>
2009-2012	Regular reviewer, <i>Elementary School Journal</i>
2008	Reviewer, Informal Science Education Program (NSF)
2006	Reviewer, Human and Social Dynamics Program (NSF)
2005-2011	Reviewer, <i>Science Education</i>
2004	Reviewer, SBIR program (NSF)
2003	Reviewer, ROLE program (NSF)
1996-2000	Reviewer, <i>Journal of Research on the Teaching of English</i>
1995-1997	Vice President, Cultural-Historical SIG of the American Educational Research Association

## **MEMBERSHIPS**

American Educational Research Association  
International Society of the Learning Sciences  
National Association for Research in Science Teaching  
National Science Teachers Association

## **DOCTORAL STUDENTS**

### *Current Doctoral Students (chair or co-chair)*

Melissa Campanella, University of Colorado Boulder

Keelin O'Connor, University of Colorado Boulder

### *Past Students (chair or co-chair)*

Heather MacGillivray, University of Colorado Boulder (Ph.D., 2014)

Chad Nash, University of Colorado Boulder (Ph.D., 2015)

Sam Severance, University of Colorado Boulder (Ph.D., 2016)

Carrie D. Allen, University of Colorado Boulder (Ph.D., 2016)

Ashley Potvin, University of Colorado Boulder (Ph.D., 2017)

Josephina Chang-Order, University of Colorado Boulder (Ph.D., 2019)

Tanya Ennis, University of Colorado Boulder (Ph.D., 2022)

Robbin Riedy, University of Colorado Boulder (Ph.D., 2022)

Ali Raza, University of Colorado Boulder (Ph.D, 2022)