John F. Pane

RAND Corporation
4570 Fifth Avenue, Suite 600
Pittsburgh, PA 15213 USA

412-683-2300 x4619
jpane@rand.org
ORCID: 0000-0001-5155-2436

Research Topics

Education technology; personalized learning; rigorous methods for evaluating educational interventions and policies; math, science, and computer science education; summer learning; data driven decision-making in education; human-computer interaction.

Education

Ph.D., Computer Science**,** Carnegie Mellon University**,** Pittsburgh, PA, USA, 2002.
Advisors: Brad Myers and David Garlan
Thesis: *A Programming System for Children that is Designed for Usability*

M.S., Computer Science, Carnegie Mellon University**,** Pittsburgh, PA, USA, 1994.

B.S., Electrical and Computer Engineering and Mathematics, Carnegie Mellon University**,** Pittsburgh, PA, USA, 1985.

Professional Experience

RAND Corporation, Pittsburgh, PA, USA, 2002 – present.
Senior Scientist; adjunct starting in 2026. Principal investigator on projects employing rigorous causal methods and researching personalized learning, education technology, summer learning, math and science education reform efforts, and data driven decision-making in education.

Carnegie Mellon University, Pittsburgh, PA, USA, 1985 – 1991, 1992 – 1995.
Project Scientist and earlier titles. Designed, implemented, and evaluated educational software systems.

Biological Detection Systems, Inc., Pittsburgh, PA, USA, 1991 – 1992.
Senior Software Engineer. Developed rendering and image processing software for 3D microscopy system.

Publications

Peer Reviewed Journal Articles

Relkin, E., Doss, C., Jones, V. L., & **Pane, J. F.** (2025). Coding Readiness Assessment: A Measure of Computational Thinking for Preschoolers. *Education Sciences, 15*(1), 9. doi:10.3390/educsci15010009

Baird, M., **Pane, J.**, & Soland, J. (2024). Beyond test scores: the impact of test persistence value-added on student achievement. *Education Economics*, 1-19. doi:10.1080/09645292.2024.2435362

Sales, A. C., & **Pane, J. F.** (2021). Student Log-Data from a Randomized Evaluation of Educational Technology: A Causal Case Study. *Journal of Research on Educational Effectiveness, 14*(1), 241-269. doi:10.1080/19345747.2020.1823538

Schweig, J., **Pane, J. F.**, & McCaffrey, D. F. (2020). Switching Cluster Membership in Cluster Randomized Control Trials: Implications for Design and Analysis. *Psychological Methods, 25*(4), 516-534. doi:10.1037/met0000258

Phillips, A., **Pane, J. F.**, Reumann-Moore, R., & Shenbanjo, O. (2020). Implementing an Adaptive Intelligent Tutoring System as an Instructional Support. *Educational Technology Research and Development, 68*, 1409–1437. doi:10.1007/s11423-020-09745-w

Baird, M. D., & **Pane, J. F.** (2019). Translating Standardized Effects of Education Programs into More Interpretable Metrics. *Educational Researcher, 48*(4), 217-228. doi:10.3102/0013189X19848729

Sales, A. C., & **Pane, J. F.** (2019). The Role of Mastery Learning in an Intelligent Tutoring System: Principal Stratification on a Latent Variable. *Annals of Applied Statistics, 13*(1), 420-443. doi:10.1214/18-AOAS1196

Bingham, A. J., **Pane, J. F.**, Steiner, E. D., & Hamilton, L. S. (2018). Ahead of the Curve: Implementation Challenges in Personalized Learning School Models. *Educational Policy, 32*(3), 454-489. doi:10.1177/0895904816637688

Karam, R., **Pane, J. F.**, Griffin, B. A., Robyn, A., Phillips, A., & Daugherty, L. (2017). Examining the implementation of technology-based blended algebra I curriculum at scale. *Educational Technology Research and Development, 65*, 399-425. doi:10.1007/s11423-016-9498-6

Schweig, J. D., & **Pane, J. F.** (2016). Intention-to-treat analysis in partially nested randomized controlled trials with real-world complexity. *International Journal of Research & Method in Education, 39*(3), 268-286. doi:10.1080/1743727X.2016.1170800

Pane, J. F., Griffin, B. A., McCaffrey, D. F., & Karam, R. (2014). Effectiveness of Cognitive Tutor Algebra I at Scale. *Educational Evaluation and Policy Analysis*, 36(2), 127-144. doi:10.3102/0162373713507480

Kaufman, J. H., Karam, R., **Pane, J. F.**, & Junker, B. W. (2012). How Curriculum and Classroom Achievement Predict Teacher Time on Lecture- and Inquiry-based Mathematics Activities. *Journal of Mathematics Education at Teachers College, 3*(2), 56-62. doi:10.7916/jmetc.v3i2.759

Springer, M. G., **Pane, J. F.**, Le, V.-N., McCaffrey, D. F., Burns, S., Hamilton, L. S., & Stecher, B. (2012). Team Pay for Performance: Experimental Evidence from the Round Rock Pilot Project on Team Incentives. *Educational Evaluation and Policy Analysis, 34*(4), 367-390. doi:10.3102/0162373712439094

Pane, J. F., McCaffrey, D. F., Slaughter, M. E., Steele, J. L., & Ikemoto, G. S. (2010). An Experiment to Evaluate the Efficacy of Cognitive Tutor Geometry. *Journal of Research on Educational Effectiveness, 3*(3), 254-281. doi:10.1080/19345741003681189

Straus, S. G., Bikson, T. K., Balkovich, E., & **Pane, J. F.** (2010). Mobile Technology and Action Teams: Assessing BlackBerry Use in Law Enforcement Units. *Computer Supported Cooperative Work, 19*(1), 45-71. doi:10.1007/s10606-009-9102-2

Pane, J. F., McCaffrey, D. F., Kalra, N., & Zhou, A. J. (2008). Effects of Student Displacement in Louisiana During the First Academic Year After the Hurricanes of 2005. *Journal of Education for Students Placed at Risk, 13*(2-3), 168-211. doi:10.1080/10824660802350169

Ward, M. E., Shelley, K., Kaase, K., & **Pane, J. F.** (2008). Hurricane Katrina: A Longitudinal Study of the Achievement and Behavior of Displaced Students. *Journal of Education for Students Placed at Risk, 13*, 297-317. doi:10.1080/19345741003681189

Myers, B. A., **Pane, J. F.**, & Ko, A. (2004). Natural Programming Languages and Environments. *Communications of the ACM, 47*(9), 47-52. doi:10.1145/1015864.1015888

Pane, J. F., Ratanamahatana, C. A., & Myers, B. A. (2001). Studying the Language and Structure in Non-Programmers' Solutions to Programming Problems. *International Journal of Human-Computer Studies, 54*(2), 237-264. doi:10.1006/ijhc.2000.0410

Miller, P., **Pane, J.**, Meter, G., & Vorthmann, S. (1994). Evolution of Novice Programming Environments: The Structure Editors of Carnegie Mellon University. *Interactive Learning Environments, 4*(2), 140-158. doi:10.1080/1049482940040202

Peer Reviewed RAND Publications

Barnes-Proby, D., Bush-Mecenas, S., Blagg, T. L., Doss, C. J., **Pane, J. F.**, & Jeffries, J. (2024). *Expanding the Village of Support Through Virtual Mentoring: Evaluation of the U.S. Dream Academy Mentoring Program*. Santa Monica, CA: RAND Corporation. rand.org/t/RRA3442-1

Pane, J. F., Seaman, D., & Doss, C. J. (2023). *Students Using Lexia® Core5® Reading Show Greater Reading Gains Than Matched Comparison Students*. Santa Monica, CA: RAND Corporation. rand.org/t/RRA2859-1

Baker, G., Faxon-Mills, S., Huguet, A., **Pane, J. F.**, & Hamilton, L. S. (2021). *Approaches and Obstacles to Promoting Media Literacy Education in U.S. Schools*. Santa Monica, CA: RAND Corporation. rand.org/t/RRA112-19

Huguet, A., **Pane, J. F.**, Baker, G., Hamilton, L. S., & Faxon-Mills, S. (2021). *Media Literacy Education to Counter Truth Decay: An Implementation and Evaluation Framework.* Santa Monica, CA: RAND Corporation. rand.org/t/RRA112-18

Huguet, A., Baker, G., Hamilton, L. S., & **Pane, J. F.** (2021). *Media Literacy Standards to Counter Truth Decay*. Santa Monica, CA: RAND Corporation. rand.org/t/RRA112-12

McCombs, J. S., Augustine, C. H., **Pane, J. F.**, & Schweig, J. (2020). *Every Summer Counts: A Longitudinal Analysis of Outcomes from the National Summer Learning Project*. Santa Monica, CA: RAND Corporation. rand.org/t/RR3201

Steiner, E. D., Hamilton, L. S., **Pane, J. F.**, Schweig, J., Stelitano, L., Pane, J. D., & Meyers, S. (2020). *Building and Sustaining Innovative High Schools: Findings from the Opportunity by Design Study*. Santa Monica, CA: RAND Corporation. rand.org/t/RRA322-3

Phillips, A., Kaufman, J. H., **Pane, J. F.**, Lee, E., & Bogart, A. (2019). *Implementation and Outcomes of the Appalachian Renaissance Initiative in Eastern Kentucky Schools.* Santa Monica, CA: RAND Corporation rand.org/t/RR2837

Pane, J. F. (2018). *Strategies for Implementing Personalized Learning While Evidence and Resources Are Underdeveloped*. Santa Monica, CA: RAND Corporation. rand.org/t/PE314

Best, K. L., & **Pane, J. F.** (2018). *Privacy and Interoperability Challenges Could Limit the Benefits of Education Technology*. Santa Monica, CA: RAND Corporation. rand.org/t/PE313

Phillips, A., **Pane, J. F.**, & Bogart, A. (2018). *Evaluation of the Creating College and Career Readiness Initiative in Kentucky*. Santa Monica, CA: RAND Corporation. rand.org/t/RR2745

Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & Pane, J. D. (2017). *Informing Progress: Insights on Personalized Learning Implementation and Effects*. Santa Monica, CA: RAND Corporation. rand.org/t/RR2042

Augustine, C. H., McCombs, J. S., **Pane, J. F.**, Schwartz, H. L., Schweig, J., McEachin, A., & Siler-Evans, K. (2016). *Learning from Summer: Effects of Voluntary Summer Learning Programs on Low-Income Urban Youth*. Santa Monica, CA: RAND Corporation. rand.org/t/RR1557

Pane, J. F., Steiner, E. D., Baird, M. D., & Hamilton, L. S. (2015). *Continued Progress: Promising Evidence on Personalized Learning*. Santa Monica, CA: RAND Corporation. rand.org/t/RR1365

McCombs, J. S., **Pane, J. F.**, Augustine, C. H., Schwartz, H. L., Martorell, P., & Zakaras, L. (2014). *Ready for Fall? Near-Term Effects of Voluntary Summer Learning Programs on Low-Income Students' Learning Opportunities and Outcomes*. Santa Monica, CA: RAND Corporation. rand.org/t/RR815

Daugherty, L., Phillips, A., **Pane, J. F.**, & Karam, R. (2012). *Analysis of Costs in an Algebra I Curriculum Effectiveness Study*. Santa Monica, CA: RAND Corporation. rand.org/t/TR1171-1

Pane, J. F., Williams, V. L., Olmsted, S. S., Yuan, K., Spindler, E., & Slaughter, M. E. (2009). *Math Science Partnership of Southwest Pennsylvania: Measuring Progress Towards Goals*. Santa Monica, CA: RAND Corporation. rand.org/t/MG857

Pane, J. F., McCaffrey, D. F., Tharp-Taylor, S., Asmus, G. J., & Stokes, B. R. (2006). *Student Displacement in Louisiana After the Hurricanes of 2005: Experiences of Public Schools and Their Students*. Santa Monica, CA: RAND. rand.org/t/TR430

Marsh, J. A., **Pane, J. F.**, & Hamilton, L. S. (2006). *Making Sense of Data-Driven Decision Making: Evidence from Recent RAND Research*. Santa Monica, CA: RAND Corporation. rand.org/t/OP170

Kerr, K. A., **Pane, J. F.**, & Barney, H. (2003). *Quaker Valley Digital School District: Early Effects and Plans for Future Evaluation*. Santa Monica, CA: RAND Corporation. rand.org/t/TR107

Pane, J. F., & Joe, L. (2004). *Making Better Use of Bandwidth: Data Compression and Network Management Technologies*. Santa Monica, CA: RAND Corporation. rand.org/t/TR216

Conference Presentations

Szabo, J., Todd, I., Tekkumru Kisa, M., & **Pane, J.F.** (2024, March 15). *To Remediate or Accelerate? Teachers' Perceptions of Zearn Math Implementation in Their Elementary Classrooms*. Paper presented at the 49th Annual Conference of the Association for Education Finance and Policy, Baltimore, MD.

Sales, A., Prihar, E., Heffernan, N., & **Pane, J. F.** (2021, June 29 - July 2). *The Effect of an Intelligent Tutor on Performance on Specific Posttest Problems.* Proceedings of the Fourteenth International Conference on Educational Data Mining (EDM), Paris, France.

Baird, M., & **Pane, J. F.** (2018). *Translating Standardized Education Program Effects into More Interpretable Metrics*. Paper presented at the SREE Spring 2018 Conference, Society for Research on Educational Effectiveness, Washington, DC.

Sales, A. C., & **Pane, J. F.** (2018). *Theory Vs. Practice of Mastery Learning in the Cognitive Tutor: Principal Stratification on a Latent Variable*. Paper presented at the SREE Spring 2018 Conference, Society for Research on Educational Effectiveness, Washington, DC.

Pane, J. F., & Steiner, E. D. (2017, November 7). *Personalized Learning: Insights on Effects and Implementation.* Presented at TRETC Three Rivers Education Technology Conference McKees Rocks, PA.

Pane, J. F., & Steiner, E. D. (2017, October 23-25). *Personalized Learning: Insights on Effects and Implementation.* Presented at iNACOL Symposium 2017, Orlando, FL.

Pane, J. F., Steiner, E. D., & McCann, C. (2017, September 7-8). *Relating RTT-D's Work to Broader Research on Personalized Learning.* Presented at 2017 Personalized Learning Summit: A Lasting Legacy: What's Next in Personalized Learning?, Washington, DC.

Sales, A. C., Wilks, A., & **Pane, J. F.** (2016, June 29 - July 2). *Student Usage Predicts Treatment Effect Heterogeneity in the Cognitive Tutor Algebra I Program.* Proceedings of the 9th International Conference on Educational Data Mining (EDM), Raleigh, NC, 207-214.

Sales, A. C., & **Pane, J. F.** (2016). *Modeling the Treatment Effect from Educational Technology as a Function of Student Usage*. Paper presented at the 41st Annual Conference of the Association for Education Finance and Policy, Denver, CO.

Baird, M., & **Pane, J. F.** (2016). *Dealing with Variation in Test Conditions When Estimating Program Effects*. Paper presented at the 41st Annual Conference of the Association for Education Finance and Policy, Denver, CO.

Sales, A. C., & **Pane, J. F.** (2015, June 26-29). *Exploring Causal Mechanisms in a Randomized Effectiveness Trial of the Cognitive Tutor.* Proceedings of the 8th International Conference on Educational Data Mining (EDM), Madrid, Spain, 504-507.

Schweig, J., & **Pane, J. F.** (2015). *Partially Nested Randomized Control Trials in Educational Research: Applications to a Summer Learning Program*. Paper presented at the Modern Modeling Methods (M3) Conference: 2015, Storrs, CT.

Augustine, C. H., McCombs, J. S., **Pane, J.**, & Schwartz, H. L. (2015). *Findings From a Randomized Controlled Trial on Five Voluntary Summer Learning Programs Across the Country*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Pane, J. F., Hamilton, L. S., & Steiner, E. D. (2015). *Personalized Learning: Implementation Details and Effects on Student Achievement*. Paper presented at the Association for Education Finance and Policy 40th Annual Conference, Washington D.C.

McCombs, J., Augustine, C., **Pane, J.**, & Schwartz, H. (2015). *Early Effects of Voluntary Academic and Enrichment Summer Programs on Low-Income Students' Learning Opportunities and Outcomes: Findings from a Five-District Randomized Controlled Trial*. Paper presented at the Association for Education Finance and Policy 40th Annual Conference, Washington D.C.

Benson, S., Bernatek, B., & **Pane, J.** (2015). *Research Findings on Schools that are Pursuing Personalized Learning*. Paper presented at the iNACOL Blended and Online Learning Symposium, Palm Springs, CA.

Pane, J. F., Griffin, B. A., McCaffrey, D. F., & Karam, R. (2013). *Effectiveness of Cognitive Tutor Algebra I at Scale*. Paper presented at the SREE Spring 2013 Conference, Society for Research on Educational Effectiveness, Washington, DC.

Karam, R., **Pane, J. F.**, & Griffin, B. A. (2013). *Examining the Implementation of the Cognitive Tutor Algebra I (CTAI) Curriculum in Middle and High Schools*. Paper presented at the SREE Spring 2013 Conference, Society for Research on Educational Effectiveness, Washington, DC.

Ikemoto, G. S., Steele, J. L., **Pane, J. F.**, & Lichter, D. (2012). *Implementation Study Results of an Efficacy Trial of the Cognitive Tutor Geometry Curriculum*. Paper presented at the Achieving Success at Scale: Research on Effective High Schools, Nashville, TN.

Kaufman, J. H., Karam, R. T., & **Pane, J. F.** (2012). *The Role of Reform-Oriented Mathematics Curriculum in More Equitable Instruction*. Paper presented at the Annual Meeting of the American Educational Research Association, Vancouver, Canada.

McCaffrey, D. F., Lockwood, J. R., Griffin, B. A., Setodji, C. M., & **Pane, J. F.** (2012). *Correcting for Broken Randomization Using Error-Prone Achievement Test Scores in Propensity Score Weighting*. Paper presented at the SREE Fall 2012 Conference, Society for Research on Educational Effectiveness, Washington, DC.

Kaufman, J. H., Karam, R., **Pane, J. F.**, & Junker, B. (2012). *How curriculum and students' algebra readiness influence time teachers spend on traditional and reform-oriented mathematics activities*. Paper presented at the SREE Fall 2012 Conference, Society for Research on Educational Effectiveness, Washington, DC.

Pane, J. F., Griffin, B. A., McCaffrey, D. F., & Karam, R. (2011). *The Challenge of Authenticity in Scale-Up Effectiveness Trials*. Paper presented at the SREE Fall 2011 Conference, Society for Research on Educational Effectiveness, Washington, DC.

McCaffrey, D. F., **Pane, J. F.**, Springer, M. G., Burns, S., & Haas, A. (2011). *Team Pay for Performance: Experimental Evidence from Round Rock's Project on Incentives in Teaching*. Paper presented at the Spring 2011 Conference of the Society for Research on Educational Effectiveness, Washington, DC.

Karam, R., **Pane, J.**, Griffin, B. A., Daugherty, L., Robyn, A., Ikemoto-Schuyler, G., & Waite, A. (2009). *Examining the Implementation of the Cognitive Tutor Algebra 1 Curriculum in Middle and High Schools*. Paper presented at the Annual Meeting of the American Educational Research Association, San Diego, CA.

Pane, J. F., McCaffrey, D. F., Ikemoto, G. S., Steele, J. L., & Slaughter, M. E. (2009). *Results from a Randomized Efficacy Trial of Cognitive Tutor Geometry*. Paper presented at the Second Annual Conference of the Society for Research on Educational Effectiveness, Washington, DC.

McCaffrey, D. F., **Pane, J. F.**, Slaughter, M. E., Lockwood, J. R., & Springer, M. G. (2009). *Examples of Blocking in Multilevel Experiments*. Paper presented at the Second Annual Conference of the Society for Research on Educational Effectiveness, Washington, DC.

Griffin, B. A., McCaffrey, D. F., & **Pane, J. F.** (2009). *Evaluating the Use of Blocking in Cluster Randomized Control Trials*. Paper presented at the Second Annual Conference of the Society for Research on Educational Effectiveness, Washington, DC.

Ward, M. E., Shelley, K., Kaase, K., & **Pane, J. F.** (2008). *Hurricane Katrina and Displaced Students: Achievement and Behavior in the Wake of the Storm*. Paper presented at the Annual Meeting of the American Educational Research Association, New York.

Pane, J. F., & McCaffrey, D. F. (2007). *Effects of Student Displacement on Schools and Students in Louisiana*. Paper presented at the Annual Meeting of the American Educational Research Association, Chicago, IL.

Pane, J. F. (2006). *Data Driven Decisionmaking in Southwestern Pennsylvania School Districts*. Paper presented at the Annual Meeting of the National Council on Measurement in Education, San Francisco, CA.

Pane, J. F., Myers, B. A., & Miller, L. B. (2002). Using HCI Techniques to Design a More Usable Programming System *Proceedings of IEEE 2002 Symposia on Human Centric Computing Languages and Environments (HCC 2002)* (pp. 198-206). Arlington, VA: IEEE Computer Society. doi:10.1109/HCC.2002.1046372

Pane, J. F., & Myers, B. A. (2002). The Impact of Human-Centered Features on the Usability of a Programming System for Children *CHI 2002 Extended Abstracts: Conference on Human Factors in Computing Systems* (pp. 684-685). Minneapolis, MN: ACM Press. doi:10.1145/506443.506545

Pane, J. F. (2001, September 5-7). *Human-Centered Design of a Programming System for Children.* Paper presented at the Children's Programming Odyssey Workshop, HCC 2001 IEEE Symposia on Human-Centric Computing Languages and Environments, Stresa, Italy.

Pane, J. F., & Myers, B. A. (2000). Improving User Performance on Boolean Queries. In G. Szwillus & T. Turner (Eds.), *CHI 2000 Extended Abstracts: Conference on Human Factors in Computing Systems* (pp. 269-270). The Hague, Netherlands: ACM Press. doi:10.1145/633292.633449

Pane, J. F., & Myers, B. A. (2000). The Influence of the Psychology of Programming on a Language Design: Project Status Report. In A. F. Blackwell & E. Bilotta (Eds.), Proceedings of the 12th Annual Meeting of the Psychology of Programmers Interest Group (pp. 193-205). Corigliano Calabro, Italy: Edizioni Memoria. www.ppig.org/library/paper/influence-psychology-programming-language-design-project-status-report

Pane, J. F., & Myers, B. A. (2000). Tabular and Textual Methods for Selecting Objects from a Group *Proceedings of VL 2000: IEEE International Symposium on Visual Languages* (pp. 157-164). Seattle, WA: IEEE Computer Society. doi:10.1109/VL.2000.874379

Pane, J. F. (1998). Designing a Programming System for Children with a Focus on Usability *CHI 98 Summary: Conference on Human Factors in Computing Systems* (pp. 62-63). Los Angeles: ACM Press. doi:10.1145/286498.286530

Pane, J. F. (1997, October 24). *A Programming System for Children that is Designed for Usability.* Paper presented at the 7th Workshop on Empirical Studies of Programmers: Graduate Student Workshop, Alexandria, VA.

Myers, B. A., Modugno, F., McDaniel, R., Kosbie, D., Werth, A., Miller, R. C., **Pane, J.**, Landay, J., Goldstein, J., & Goldberg, M. A. (1996, March 25-27). *The Demonstrational Interfaces Project at CMU.* Paper presented at the 1996 AAAI Spring Symposium on Acquisition, Learning and Demonstration: Automating Tasks for Users, Stanford, CA.

Pane, J. F., Corbett, A. T., & John, B. E. (1996). Assessing Dynamics in Computer-Based Instruction *Proceedings of ACM CHI 96 Conference on Human Factors in Computing Systems* (pp. 197-204). Vancouver, BC, Canada. doi:10.1145/238386.238482

Chuah, M. C., John, B. E., & **Pane, J.** (1994). Analyzing Graphic and Textual Layouts with GOMS: Results of a Preliminary Analysis *CHI 94 Conference Companion: Conference on Human Factors in Computing Systems* (Vol. 2, pp. 323-324). Boston, MA. doi:10.1145/259963.260393

Pane, J. F., & Miller, P. L. (1993). The ACSE Multimedia Science Learning Environment. In T.-W. Chan (Ed.), *Proceedings of the 1993 International Conference on Computers in Education* (pp. 168-173). Taipei, Taiwan. www.cs.cmu.edu/~acse/icce93.html

Pane, J. F., & Miller, P. L. (1993). The ACSE Multimedia Environment for Science Education *1993 International Conference for Computer Technologies in Education*. Kiev, Ukraine.

Goldenson, D. R., Chandhok, R. P., Garlan, D. H., Meter, G., Miller, P. L., **Pane, J.**, . . . Skwarecki, E. J. (1992). GENIE: Developing and Assessing State-of-the-Art Integrated Programming Environments. *CHI 91 Formal Video Program: Conference on Human Factors in Computing Systems, 24*(2), 39-40. doi:10.1145/142386.1055544

Chandhok, R., Miller, P., **Pane, J.**, & Meter, G. (1990, April). *Structure Editing: Evolution Towards Appropriate Use.* Paper presented at the 1990 ACM SIGCHI Workshop on Structure Editors, Seattle, WA.

Carrasquel, J., Roberts, J., & **Pane, J.** (1989). The Design Tree: A Visual Approach to Top-Down Design and Data Flow. *SIGCSE Bulletin: Twentieth SIGCSE Technical Symposium on Computer Science Education* (Vol. 21, pp. 17-21). Louisville, KY. doi:10.1145/65294.65296

Roberts, J., **Pane, J.**, Stehlik, M., & Carrasquel, J. (1988). The Design View: A Design Oriented, High-Level Visual Programming Environment. *Proceedings of the 1988 IEEE Workshop on Visual Languages* (pp. 213-220). Pittsburgh, PA. doi:10.1109/WVL.1988.18031

McKeown, D. M., & **Pane, J. F.** (1985). Alignment and Connection of Fragmented Linear Features in Aerial Imagery. *Proceedings of the 1985 IEEE Conference on Computer Vision and Pattern Recognition* (pp. 55-61). San Francisco, CA.

Research Briefs, Infographics, Addenda, and Working Papers

Pane, J. F., Doss, C., Todd, I., & Seaman, D. (2025). Efficacy of Zearn Math over two years in grades 3 to 5: An experiment in Texas. EdWorkingPaper: 25-1211, Annenberg Institute at Brown University. doi:10.26300/e3bq-7g59

Doss, C., **Pane, J. F.**, & Jones, V. (2025). Teaching Computational Thinking to Children in Head Start Classrooms: Results from a Randomized Controlled Trial. EdWorkingPaper: 25-1224, Annenberg Institute at Brown University. doi:10.26300/04gr-bv36

Barnes-Proby, D., Bush-Mecenas, S., Blagg, T. L., Doss, C. J., **Pane, J. F.**, & Jeffries, J. (2024). *The U.S. Dream Academy's Mentoring Model: Adaptive Programming to Meet Youth and Family Needs*. Santa Monica, CA: RAND Corporation. rand.org/t/RBA3442-1

Steiner, E. D., Hamilton, L. S., **Pane, J. F.**, Schweig, J., Stelitano, L., Pane, J. D., & Meyers, S. (2020). *Designing and Sustaining Innovative High Schools: Successes, Challenges, and Student Outcomes*. Santa Monica, CA: RAND Corporation. rand.org/t/RRA322-1

Baird, M. D., & **Pane, J. F.** (2018). *Translating Standardized Effects of Education Programs into More Interpretable Metrics*. Santa Monica, CA: RAND Corporation, WR-1226-BMGF. rand.org/t/WR1226

Baird, M. D., & **Pane, J. F.** (2018). *Controlling for Changes in Test Conditions when Estimating Education Intervention Effects*. Santa Monica, CA: RAND Corporation, WR-1245-BMGF. rand.org/t/WR1245

Sales, A. C., & **Pane, J. F.** (2018). Student Log-Data from a Randomized Evaluation of Educational Technology: A Causal Case Study. *e-print ArXiv, 1808.02528*. arxiv.org/abs/1808.02528

Israni, A., Sales, A. C., & **Pane, J. F.** (2018). Mastery Learning in Practice: A (Mostly) Descriptive Analysis of Log Data from the Cognitive Tutor Algebra I Effectiveness Trial. *ArXiv e-prints, 1802.08616*. arxiv.org/abs/1802.08616

Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & Pane, J. D. (2017). *How Does Personalized Learning Affect Student Achievement?* (RB-9994-BMGF). Retrieved from Santa Monica, CA: rand.org/t/RB9994

Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & Pane, J. D. (2017). *Observations and Guidance on Implementing Personalized Learning* (RB-9967-BMGF). Retrieved from Santa Monica, CA: RAND Corporation. rand.org/t/RB9967

Pane, J. F., Steiner, E. D., Baird, M. D., Hamilton, L. S., & Pane, J. D. (2017). *Informing Progress: Personalized Learning Teacher and Student Survey Results*. Santa Monica, CA: RAND Corporation. rand.org/content/dam/rand/pubs/research_reports/RR2000/RR2042/RAND_RR2042z1.pdf

Augustine, C. H., McCombs, J. S., **Pane, J. F.**, Schwartz, H. L., Schweig, J., McEachin, A., & Siler-Evans, K. (2016). *Study Suggests: Kids Who Attend More Thrive More*. Santa Monica, CA: RAND Corporation. rand.org/t/IG127

Augustine, C. H., McCombs, J. S., **Pane, J. F.**, Schwartz, H. L., Schweig, J., McEachin, A., & Siler-Evans, K. (2016). *Kids Who Attend More Benefit More: Voluntary Summer Learning Programs*. Santa Monica, CA: RAND Corporation. rand.org/t/RB9924

Steiner, E. D., Hamilton, L. S., Peet, E., & **Pane, J. F.** (2015). *Continued Progress: Promising Evidence on Personalized Learning: Survey Results Addendum*. Santa Monica, CA: RAND Corporation, RR-1365/2-BMGF. rand.org/t/RR1365z2

McCombs, J. S., **Pane, J. F.**, Augustine, C. H., Schwartz, H. L., Martorell, P., & Zakaras, L. (2014). *First Outcomes from the National Summer Learning Study*. Santa Monica, CA: RAND Corporation, RB-9819-WF. rand.org/t/RB9819

Pane, J. F., & Baird, M. (2014). *Methods Used to Estimate Achievement Effects in Personalized Learning Schools*. Santa Monica, CA: RAND Corporation, WR-1061-BMGF. rand.org/t/WR1061

Siler-Evans, K., Steiner, E. D., Hamilton, L. S., & **Pane, J. F.** (2014). *Personalized Learning Instructional Staff Survey Results (Spring 2014)*. Santa Monica, CA: RAND Corporation, WR-1062-BMGF. rand.org/t/WR1062

Pane, J. F., Griffin, B. A., McCaffrey, D. F., & Karam, R. (2014). *Addendum to Effectiveness of Cognitive Tutor Algebra I at Scale*. Santa Monica, CA: RAND Corporation, WR-1050-DEIES. rand.org/t/WR1050

Pane, J. F., Griffin, B. A., McCaffrey, D. F., Karam, R., Daugherty, L. & Phillips, A. (2013). *Does an Algebra Course with Tutoring Software Improve Student Learning?* Santa Monica, CA: RAND Corporation, RB-9746-DEIES. rand.org/t/RB9746

Springer, M. G., **Pane, J. F.**, Le, V.-N., McCaffrey, D. F., Burns, S. F., Hamilton, L. S., & Stecher, B. M. (2012). *No Evidence That Incentive Pay for Teacher Teams Improves Student Outcomes: Results from a Randomized Trial* (RB-9649). Retrieved from Santa Monica, CA: rand.org/t/RB9649/

Tananis, C. A., **Pane, J. F.**, Williams, V. L., Olmsted, S. S., Ciminillo, C., & Tharp-Taylor, S. (2007). *Math Science Partnership of Southwest Pennsylvania: Year Four Evaluation Report*. Santa Monica, CA: RAND, WR-494-AIU. rand.org/t/WR494

Straus, S. G., Bikson, T. K., Balkovich, E., & **Pane, J. F.** (2007). *Mobile Technology and Action Teams: Assessing BlackBerry Use in Law Enforcement Units*. Santa Monica, CA: RAND Corporation, WR-458. rand.org/t/WR458

Pane, J. F., McCaffrey, D. F., Tharp-Taylor, S., Asmus, G. J., & Stokes, B. R. (2006). *How the 2005 Hurricanes Affected Students in Louisiana*. Santa Monica, CA: RAND Corporation, RB-9231-RC. rand.org/t/RB9231

Steele, J. L., **Pane, J. F.**, Williams, V. L., & Olmsted, S. S. (2006). *Professional Development Participation and the Role of Administrator Involvement in the Math Science Partnership of Southwest Pennsylvania*. Santa Monica, CA: RAND Corporation, WR-428-AIU. rand.org/t/WR428/

Williams, V. L., **Pane, J. F.**, Tananis, C. A., Olmsted, S. S., & Ciminillo, C. (2006). *Math Science Partnership of Southwest Pennsylvania: Year Three Evaluation Report*. Santa Monica, CA: RAND, WR-396-AIU. rand.org/t/WR396

Dembosky, J. W., **Pane, J. F.**, Barney, H., & Christina, R. (2005). *Data Driven Decisionmaking in Southwestern Pennsylvania School Districts*. Santa Monica, CA: RAND Corporation, WR-326-HE/GF. rand.org/t/WR326

Williams, V. L., **Pane, J. F.**, Tananis, C. A., & Olmsted, S. S. (2005). *Math Science Partnership of Southwest Pennsylvania: Year Two Evaluation Report*. Santa Monica, CA: RAND, WR-270-EDU. rand.org/t/WR270

Non-refereed Technical Reports

Pane, J. F. (2002). *A Programming System for Children that is Designed for Usability.* Ph.D. Thesis, Carnegie Mellon University, Pittsburgh, PA. reports-archive.adm.cs.cmu.edu/anon/2002/CMU-CS-02-127.pdf

Pane, J. F., & Myers, B. A. (1996). *Usability Issues in the Design of Novice Programming Systems*. Pittsburgh, PA: Carnegie Mellon University. reports-archive.adm.cs.cmu.edu/anon/1996/CMU-CS-96-133.ps

Pane, J. F. (1994). *Assessment of the ACSE Science Learning Environment and the Impact of Movies and Simulations*. Pittsburgh, PA: Carnegie Mellon University. www.cs.cmu.edu/~acse/cmu-cs-94-162.html

McKeown, D. M., & **Pane, J. F.** (1985). *Alignment and Connection of Fragmented Linear Features in Aerial Imagery*. Pittsburgh, PA: Carnegie Mellon University.

Refereed Book Chapters

Ikemoto, G. S., Steele, J. L., & **Pane, J. F.** (2016). Poor Implementation of Learner-Centered Practices: A Cautionary Tale. *Teachers College Record* (Yearbook), 118(13), 1-34.

Pane, J. F., & Myers, B. A. (2006). More Natural Programming Languages and Environments. In H. Lieberman, F. Paterno & V. Wulf (Eds.), *End User Development* (Vol. 9, pp. 31-50). Dordrecht, The Netherlands: Springer.

Farkas, D. L., Baxter, G., DeBasio, R. L., Gough, A., Nederlof, M. A., Pane, D., **Pane, J.**, Patek, D. R., Ryan, K. W., & Taylor, D. L. (1993). Multimode Light Microscopy and the Dynamics of Molecules, Cells, and Tissues. In J. F. Hoffman (Ed.), *Annual Review of Physiology* (Vol. 55, pp. 785-817). Palo Alto, CA: Annual Review Inc.

Opinion Pieces

Hamilton, L. S., **Pane, J. F.**, & Steiner, E. D. (2020). At This Time of School Closures and Remote Learning, How to Keep Students Engaged and Tend to Their Social-Emotional Health. *The 74*. www.the74million.org/article/analysis-at-this-time-of-school-closures-and-remote-learning-how-to-keep-students-engaged-and-tend-to-their-social-emotional-health/

Pane, J. F. & Baird, M.D. (2019). Did One Program Really Cost Students 276 Years of Learning? (Spoiler: No.). *Education Week* commentary. www.edweek.org/ew/articles/2019/06/28/did-one-program-really-cost-students-276.html

Pane, J. F. (2017). What Emerging Research Says About the Promise of Personalized Learning. Commentary on the *Brookings Brown Center Chalkboard*. www.brookings.edu/blog/brown-center-chalkboard/2017/08/15/what-emerging-research-says-about-the-promise-of-personalized-learning/

Pane, J. F., & Hamilton, L. S. (2016). Keeping Pittsburgh Out Front: Research Can Help Southwestern Pennsylvania Stay on the Cutting Edge of Education Innovation. *Pittsburgh Post-Gazette*. www.post-gazette.com/opinion/Op-Ed/2016/05/08/Keeping-Pittsburgh-out-front/stories/201605080020

Pane, J. F., & Hamilton, L. S. (2016). Technology Is Only Part of Personalized Learning. Commentary on the *RAND Blog*. rand.org/blog/2016/03/technology-is-only-part-of-personalized-learning.html

Pane, J. F. (2015). Making Room for New Approaches: Recommendations for ESEA Reauthorization That Support Innovation. Commentary on the *RAND Blog*. rand.org/blog/2015/01/making-room-for-new-approaches-recommendations-for.html

Pane, J. F. (2012). Helping Displaced Students in the Wake of Hurricane Sandy. Commentary on the *RAND Blog*. rand.org/blog/2012/10/helping-displaced-students-in-the-wake-of-hurricane.html

Pane, J. F. (2007). When Students Disappear...: The Need for a National System to Share Student Information. *Education Week, 26*(24), 48.

Invited Presentations and Keynotes

"Harnessing Research into Practice in Education," Invited Panelist, *University of Pennsylvania Graduate School of Education Catalyst Bootcamp*, February 18, 2019, Philadelphia, PA.

"Personalized Learning: A Research Perspective on Implementation Strategies," Invited Panelist, *SWPA Personalized Learning Leadership Conference*, June 26, 2019, Pittsburgh, PA.

"How Can Research Guide PL Implementation?," Invited Panelist, *LearnLaunch Across Boundaries Conference*, February 1, 2019, Boston, MA.

"Measuring Personalized Learning," Invited Panelist, *LEAP Innovated Summit*, August 28, 2018, Chicago, IL.

"Emerging Personalized Learning Research and Best Practices: Does it Work?", Invited Panelist, *Personalized Learning Leadership: Moving from Theory to Action*, Pittsburgh Personalized Learning Network Conference, June 26, 2018, Pittsburgh, PA.

"Technology-Enabled Adaptive Learning: Effects, Implementation Challenges, and Evidence-Based Adoption," Invited presentation at *Understanding the Barriers to Adoption of Technology in Education*, Carnegie Mellon University, June 1-2, 2018, Pittsburgh, PA.

"But Does it Work?", Invited Panelist, *2018 ASU+GSV Summit*, April 16-18, 2018, San Diego, CA.

"Personalized Learning: New Strategies for Leveraging Technology to Improve Education Outcomes," Invited Panelist, *Relevance & Rigor: Creating the Future of Education Research*, IES Annual Principal Investigator Meeting, January 9-10, 2018, Arlington, VA.

"Evidence on Leveraging Technology to Improve Education Outcomes," Invited presentation at *OECD-IES Seminar on Using Educational Research and Innovation to Address Inequality and Achievement Gaps in Education*, December 11-12, 2017, Washington, DC.

"Personalized Learning: New Strategies for Leveraging Technology in Education," Invited presentation at *Topics in Education Policy,* Pennsylvania Center for Women & Politics, November 16, 2017, Pittsburgh, PA.

"Informing Progress: Insights on Personalized Learning Implementation and Effects," Invited presentation at *Hunt Institute Common Core State Standards Partners*, August 2, 2017, Durham, NC.

"The Growing Trend Toward Personalized Learning: Insights on What It Is, Its Implementation, and Early Effects," Invited Panelist, *2017 Conference of the Society for Research on Educational Effectiveness*, March 1-4, 2017, Washington, DC.

"Opportunities and Challenges of Digital Learning," Invited Panelist, *Digital Media and Developing Minds*, Arthur M. Sackler Colloquium, National Academy of Sciences, October 13-15, 2015, Irvine, CA.

"Interim Research Findings on Schools Pursuing Personalized Learning," Invited presentation at *Michigan Virtual Learning Research Institute*, January 15, 2015, Lansing, MI.

"Measuring Educational Success: Data Driven Decisionmaking," Invited presentation at *100 Black Men Leadership Development Institute on Intervention Strategies for Realizing the Potential of All Students*, March 31, 2007, Jackson, MS.

"Data Driven Decisionmaking in Southwestern Pennsylvania School Districts," Keynote address, *Educational Leadership Initiative Symposium on Finding the Time to use Data to Drive Instructional Decisions in Districts, Schools, and Classrooms*, May 16, 2006, Pittsburgh, PA.

Media Appearances

The Economist. (2024, July 7). Will artificial intelligence transform school? Johnson, M. https://www.economist.com/special-report/2024/07/07/will-artificial-intelligence-transform-school

Economist Impact. (2021, December). Getting personal: The future of education post COVID-19. Birdwell, J., Kerle, A., Crispino, I., Burbar, C., Nolan, T., Kielstra, P., . . . Copeman, J. https://impact.economist.com/perspectives/sites/default/files/getting_personal_the_future_of_education_post_covid19_final.pdf

The Hechinger Report. (2021, January 26). What lessons does special education hold for personalized learning? Gonser, S. https://hechingerreport.org/what-lessons-does-special-education-hold-for-personalized-learning/

Wall Street Journal. (2020, November 12). The $2 Trillion Question: How to Spend on Education for the Future. Ip, G., & Morenne, B. https://www.wsj.com/articles/the-2-trillion-question-how-to-spend-on-education-for-the-future-11605229192

TES Magazine. (2020, May 29). Will personalised learning ever be possible? Creasey, S. https://www.tes.com/magazine/article/will-personalised-learning-ever-be-norm-schools

Chalkbeat. (2020, May 28). Pandemic boosts interest in 'mastery-based' learning, though evidence remains thin. Barnum, M. www.chalkbeat.org/2020/5/28/21272602/ed-tech-mastery-competency-based-learning-coronavirus

Education Week. (2019, November 6). What is personalized learning? Herold, B. www.edweek.org/ew/articles/2019/11/06/what-is-personalized-learning.html

Education Week. (2019, November 6). Principals and teachers are out of sync on personalized learning, data show. Bushweller, K. www.edweek.org/ew/articles/2019/11/06/principals-and-teachers-are-out-of-sync.html

Charlotte Observer. (2019, October 09). Did people close to Clayton Wilcox benefit from CMS deals he helped broker? Ma, A., & Clasen-Kelly, F. www.charlotteobserver.com/news/local/education/article235542657.html

Chalkbeat. (2019, May 31). A lot of iPads, little research: Inside the movement to build the classroom of the future. Kunichoff, Y., & Clasen-Kelly, F. www.chalkbeat.org/posts/chicago/2019/05/31/personalized-learning-chicago/

Chalkbeat. (2019, May 23). Summit Learning says 10% of schools quit using it each year. The real figure is 18%. Barnum, M. www.chalkbeat.org/posts/us/2019/05/23/summit-learning-the-zuckerberg-backed-platform-says-10-of-schools-quit-using-it-each-year-the-real-figure-is-higher/

Nonprofit Quarterly. (2019, April 26). Another Silicon Valley incursion into the schools, another parent protest. Lockwood, S. nonprofitquarterly.org/another-silicon-valley-incursion-into-the-schools-another-parent-protest/

The New York Times. (2019, April 21). Silicon Valley came to Kansas schools. That started a rebellion. Bowles, N. www.nytimes.com/2019/04/21/technology/silicon-valley-kansas-schools.html

The 74. (2019, March 25). Does personalized learning work? The research is too scant, too new and too nuanced to give a clear yes or no — at least for now. Hawkins, B. www.the74million.org/article/does-personalized-learning-work-the-research-is-too-scant-too-new-and-too-nuanced-to-give-a-clear-yes-or-no-at-least-for-now/

Chalkbeat. (2019, February 21). This personalized learning program was supposed to boost math scores. It didn't, new study finds. Barnum, M. chalkbeat.org/posts/us/2019/02/21/teach-to-one-study-math-scores/

Education Week - Digital Education. (2019, February 21). 'Teach to one' personalized-learning model has no effect on students' math scores, federal evaluation finds. Herold, B. blogs.edweek.org/edweek/DigitalEducation/2019/02/teach_to_one_personalized_learning_no_effect.html?cmp=SOC-SHR-FB

TulsaKids Magazine. (2019, January 18). Will the TPS personalized learning experiment work? Casey, B. www.tulsakids.com/will-the-tps-personalized-learning-experiment-work/

Chalkbeat. (2019, January 17). Summit Learning declined to be studied, then cited collaboration with Harvard researchers anyway. Barnum, M. www.chalkbeat.org/posts/us/2019/01/17/summit-learning-research-harvard/

SmartBrief. (2018, November 19). ICYMI: Most read by educators. Altmann, A. www.smartbrief.com/original/2018/11/icymi-most-read-educators-1

Fast Company. (2018, November 19). After rapid growth, Zuckerberg-backed school program faces scrutiny over effectiveness, data privacy. Melendez, S. www.fastcompany.com/90269809/after-rapid-growth-zuckerberg-backed-school-program-faces-scrutiny-over-effectiveness-and-data-privacy

NPR. (2018, November 16). The future of learning? Well, it's personal. Kamenetz, A., Feinberg, R., & Mason, K. C. www.npr.org/2018/11/16/657895964/the-future-of-learning-well-it-s-personal

Education Week. (2018, November 7). What does personalized learning mean? Whatever people want it to. Herold, B. www.edweek.org/ew/articles/2018/11/07/what-does-personalized-learning-mean-whatever-people.html

Campus Technology. (2018, November 5). Evidence on value of personalized learning still needs to catch up. Schaffhauser, D. campustechnology.com/articles/2018/11/05/evidence-on-value-of-personalized-learning-still-needs-to-catch-up.aspx

THE Journal. (2018, November 5). Report: collection of Ed data useful but challenging. Schaffhauser, D. thejournal.com/articles/2018/11/05/report-collection-of-ed-data-useful-but-challenging.aspx

New York Magazine's Intelligencer. (2018, October 11). Mark Zuckerberg is trying to transform education. This town fought back. Tabor, N. nymag.com/intelligencer/2018/10/the-connecticut-resistance-to-zucks-summit-learning-program.html

Education Week - Digital Education. (2018, October 2). RAND: How to do personalized learning with 'imperfect evidence'. Herold, B. blogs.edweek.org/edweek/DigitalEducation/2018/10/personalized_learning_imperfect_evidence_RAND.html?cmp=SOC-SHR-FB

The Hechinger Report. (2018, May 30). The massive experiment in New Orleans schools that few have noticed. Lurye, S. hechingerreport.org/the-massive-personalized-learning-experiment-in-new-orleans-schools/

EdSurge. (2018, February 21). Inside DC schools: the struggle to develop personalized learning's independent learners. Abamu, J. www.edsurge.com/news/2018-02-21-inside-dc-schools-the-struggle-to-develop-personalized-learning-s-independent-learners

Associated Press. (2018, February 11). School hooked on personalized learning through fishing lures. Franko, K. apnews.com/5483821c860e4e4b93d1646d5b00fdff

Financial Times. (2018, February 05). Personalised learning starts to change teaching methods. Thomson, A. K. www.ft.com/content/b622f752-e4ff-11e7-a685-5634466a6915

Chalkbeat. (2017, December 19). Four takeaways from Betsy DeVos's summit on innovation in K-12 education. Barnum, M. www.chalkbeat.org/posts/us/2017/12/19/four-takeaways-from-betsy-devoss-summit-on-innovation-in-k-12-education/

District Administration. (2017, December 18). Personalized learning requires more school faculty PD. DeNisco, A. districtadministration.com/personalized-learning-requires-more-school-faculty-pd/

San Diego Free Press. (2017, November 13). Hi-tech profit and power trump good pedagogy. Ultican, T. sandiegofreepress.org/2017/11/hi-tech-profit-and-power-trump-good-pedagogy/

Education Week. (2017, November 08). 6 key insights: RAND Corp. researchers talk personalized learning. Herold, B. www.edweek.org/ew/articles/2017/11/08/6-key-insights-rand-corp-researchers-talk.html

EdSurge. (2017, October 29). Resources: Jefferson Education Accelerator, Mathematica, OET, RAND, WestEd. www.edsurge.com/news/2017-10-29-resources-jefferson-education-accelerator-mathematica-oet-rand-wested

Associated Press. (2017, August 27). Can computers enhance the work of teachers? The debate is on. Danilova, M. apnews.com/cc393b2094be48c98e16f6425c999fd6

Education Week. (2017, July 19). Personalized learning: 'a cautionary tale'. Herold, B. www.edweek.org/ew/articles/2017/07/19/personalized-learning-a-cautionary-tale.html

The 74. (2017, July 11). Personalized learning for every student: How 2 very different school systems pursued a district-wide strategy. Hawkins, B. www.the74million.org/article/personalized-learning-for-every-student-how-2-very-different-school-systems-pursued-a-district-wide-strategy/

POLITICO. (2017, July 11). Time to adjust expectations on personalized learning? Hefling, K. www.politico.com/tipsheets/morning-education/2017/07/11/time-to-adjust-expectations-on-personalized-learning-221261

EdSurge. (2017, July 11). RAND report unpacks challenges and caveats about personalized learning. www.edsurge.com/news/2017-07-11-rand-report-unpacks-challenges-and-caveats-about-personalized-learning

THE Journal. (2017, July 11). Report: personalized learning helps students. Chang, B. R. thejournal.com/articles/2017/07/11/report-personalized-learning-helps-students.aspx

The Hechinger Report. (2017, July 12). When a hyped school model proves difficult to replicate. Dobo, N. hechingerreport.org/hyped-school-model-proves-difficult-replicate/

Education Week - Digital Education. (2017, July 11). Personalized learning: modest gains, big challenges, RAND study finds. Herold, B. blogs.edweek.org/edweek/DigitalEducation/2017/07/personalized_learning_research_implementation_RAND.html?cmp=SOC-SHR-FB

The 74. (2017, July 11). Personalized learning boosts math scores, new RAND study finds — but scaling is a challenge. Newcomb, T. www.the74million.org/article/personalized-learning-rand-study-math-scores/

Chalkbeat. (2017, May 22). As ed reformers urge a 'big bet' on personalized learning, research points to potential rewards — and risks. Barnum, M. www.chalkbeat.org/posts/us/2017/05/22/as-ed-reformers-urge-a-big-bet-on-personalized-learning-research-points-to-potential-rewards-and-risks/

The Daily Telegram, Adrian, MI. (2017, May 14). Tecumseh schools preparing to offer 'mass customized learning'. Shapiro, D. www.lenconnect.com/news/20170514/tecumseh-schools-preparing-to-offer-mass-customized-learning

The Atlantic. (2017, March 29). How Rhode Island is capitalizing on the promises of ESSA. Newcomb, T. www.theatlantic.com/education/archive/2017/03/will-personalized-learning-become-the-new-normal/521061/

Pittsburgh Quarterly Magazine. (2017, Winter). A question of learning. Fraser, J. pittsburghquarterly.com/pq-education/pq-schools/item/1304-a-question-of-learning.html

Education Week. (2016, October 19). Personalized learning: what does the research say? Herold, B. www.edweek.org/ew/articles/2016/10/19/personalized-learning-what-does-the-research-say.html

Bloomberg BusinessWeek. (2015, June 10). What happens when an ex-Google executive creates a school system? Satariano, A. www.bloomberg.com/tosv2.html?vid=&uuid=1f62adc0-185c-11ea-bee9-cf89dad0256c&url=L25ld3MvZmVhdHVyZXMvMjAxNS0wNi0xMC93aGF0LWhhcHBlbnMtd2hlbi1hbi1leC1nb29nbGUtZXhlY3V0aXZlLWNyZWF0ZXMtYS1zY2hvb2wtc3lzdGVtLQ==

Education Week. (2015, April 15). Blended learning research yields limited results - education week. Sparks, S. D. www.edweek.org/ew/articles/2015/04/15/blended-learning-research-yields-limited-results.html

Digital Learning Now. (2015, January 6). Top K-12 digital policy issues to watch in 2015. Roscoria, T. www.centerdigitaled.com/news/Top-K-12-Digital-Policy-Issues-to-Watch-in-2015.html

Chalkbeat. (2014, November 5). Report: How 23 charter schools have 'personalized' learning. Zubrzycki, J. www.chalkbeat.org/posts/co/2014/11/05/report-how-23-charter-schools-have-personalized-learning/

Education Week. (2014, January 29). Educators, researchers look for lessons in blended learning algebra program. Quillen, I. www.edweek.org/ew/articles/2014/01/29/19el-math.h33.html

InformationWeek. (2013, August 12). Blended learning improves test scores: study. Sheridan, K. www.informationweek.com/education/instructional-it/blended-learning-improves-test-scores-st/240159840

KQED MindShift. (2013, August 7). New research asks: does blended learning boost algebra scores? Schwartz, K. www.kqed.org/mindshift/30364/rand-study-shows-blended-learning-works

Education Week - Inside School Research. (2013, June 20). Study: hybrid algebra program 'nearly doubled' math learning. Morones, A. blogs.edweek.org/edweek/inside-school-research/2013/06/government_study_finds_gains_f.html?cmp=SOC-SHR-FB

The New York Times. (2013, June 13). Study gauges value of technology in schools. Rich, M. www.nytimes.com/2013/06/14/education/study-gauges-value-of-technology-in-schools.html

EdSurge. (2016, August 10). Did that EdTech tool really cause that growth? How to watch out for faulty efficacy studies. Madda, M. J. www.edsurge.com/news/2016-08-10-did-that-edtech-tool-really-cause-that-growth-how-to-watch-out-for-faulty-efficacy-studies

Education Week - EdTech Researcher. (2013, September 4). Educational research: to address rather than to answer. Reich, J. blogs.edweek.org/edweek/edtechresearcher/2013/09/educational_research_to_address_rather_than_to_answer.html

EdSurge. (2013, August 27). The nature of big EdTech research. Quattrocchi, C. www.edsurge.com/news/2013-08-27-the-nature-of-big-edtech-research

Southern California Public Radio. (2013, June 19). LAUSD awards Apple $30 million contract to supply iPads in classrooms. KPCC's *Take Two*. laist.com/shows/take-two/lausd-awards-apple-30-million-contract-to-supply-ipads-in-classrooms

Pittsburgh Post-Gazette. (2007, April 10). RAND to assess algebra curriculum developed by CMU. Chute, E.

Pittsburgh Tribune-Review. (2007, April 6). Carnegie Learning's computerized tutor may have math appeal. Zlatos, B.

Sirius Radio. (2006, December 13). Hurricanes disrupted schooling for Louisiana students. Across the Nation with Bob Dunning.

The Daily Advertiser, Lafayette, LA. (2006, December 2). Remember students in storm plans.

Christian Science Monitor. (2006, December 1). Displaced students need more resources, study finds. Teicher, S. A. www.csmonitor.com/2006/1201/p25s01-legn.html

The Advocate, Baton Rouge, LA. (2006, November 30). Report: Effect on students long term - Uprooted children likely to be at risk in academics. Sentell, W.

Louisiana Radio Network. (2006, November 30). Students displaced by Katrina and Rita could have years of academic and behavior problems ahead. Lincoln, S.

Associated Press. (2006, November 30). Thousands of students still at academic risk from '05 hurricanes.

Selected Grants and Contracts

Evaluation of Math Ready-Supporting Early Number Sense (M-SENS), $1,473,818, subcontract on U.S. Department of Education EIR award S411C220100, subcontract Principal Investigator, 2023-27.

Efficacy of Zearn Math, $2,955,674, U.S. Department of Education award R305A230170, Principal Investigator, 2022-25.

Lexia Research Partnership, Phase 1, $86,911, Lexia Learning Systems LLC, Principal Investigator, 2022-23.

Effectiveness Replication of Enhanced Core Reading Instruction (ECRI), $4,500,000, U.S. Department of Education award R324R210009, co-Principal Investigator, 2021-26.

Teaching Computational Thinking to Prekindergarten Students in Underrepresented Communities, $999,859, U.S. National Science Foundation award 2122436, co-Principal Investigator, 2021-24.

Math Education Technology to Accelerate School Improvement, $389,405, subcontract on U.S. Department of Education awards 91990021D0001, co-PI on prime award and subcontract PI, 2021-25.

Evaluation Support for Development of Muzology 2.0, $200,000, Muzology LLC, $200,000, subcontract on U.S. Department of Education award 91990021C0034, contract co-Principal Investigator, 2021-23.

Zearn Research Partnership, $257,341, Zearn, Principal Investigator, 2021-2022.

Digital Citizenship Curriculum Evaluation, Phase I, $90,258, Common Sense Education, co-Principal Investigator, 2020-21.

Evaluation Support for History Maker Phase II, $199,966, Schell Games, subcontract on U.S. Department of Education award 99190019C0040, subcontract Principal Investigator, 2019-21.

Evaluation Support for codeSpark Story Mode Phase II, $300,000, codeSpark, subcontract on U.S. Department of Education award 91990019C0035, subcontract Principal Investigator, 2019-21.

Formative Evaluation of History Maker, $39,876, Schell Games, subcontract on U.S. Department of Education award 91990018C0028, subcontract Principal Investigator, 2018-2019.

Long term effects of competency-based education, $89,115, KnowledgeWorks Foundation, Principal Investigator, 2018-2019.

Continued Formative Evaluation and Pilot Study of SuperChem VR: The Immersive Reality Chemistry Game, $200,000, Schell Games, subcontract on U.S. Department of Education award EDIES17C0035, subcontract Principal Investigator, 2017-2019.

Formative Evaluation of SuperChem VR: The Immersive Reality Chemistry Game, $29,945, Schell Games, subcontract on U.S. Department of Education award EDIES16C0009, subcontract Principal Investigator, 2016.

Efficacy of ALEKS for Improving Student Algebra Achievement, $1,543,409, U.S. Department of Education award R305A140221, Principal Investigator, 2014-2019.

Analyzing Student Usage and Outcome Data from a Randomized Experiment of Cognitive Tutor Algebra, $359,521, U.S. National Science Foundation award DRL-1420374, Principal Investigator, 2014-2017.

Evaluation of Appalachian Renaissance Initiative, $1,390,490, Kentucky Valley Education Cooperative, subcontract on U.S. Department of Education Race to the Top District grant, subcontract Principal Investigator, 2014-2018.

Summer Learning Efficacy Experiment, $5,000,000, Wallace Foundation, co-Principal Investigator, 2013-2018.

Evaluation of Evaluation of Personalized Learning School Models, $3,360,250, Bill & Melinda Gates Foundation, Principal Investigator, 2012-2017.

Evaluation of Career and College Readiness Transformations, $707,127, Kentucky Valley Education Cooperative, subcontract on U.S. Department of Education Investing in Innovation development grant, subcontract Principal Investigator, 2012-2017.

Carnegie Mellon and RAND Traineeships (CMART) in Methodology and Interdisciplinary Research, $654,619, U.S. Department of Education award R305B100012, co-Director, 2010-2015.

Education Technology Research and Practice: Recent Trends and Opportunities for Southwestern Pennsylvania, $45,000, Claude Worthington Benedum Foundation, Grable Foundation, Heinz Endowments, and Pittsburgh Foundation, co-Principal Investigator, 2009-2010.

Effectiveness of Cognitive Tutor Algebra I Implemented at Scale, $5,999,950, U.S. Department of Education award R305A070185, Principal Investigator, 2007-2013.

Experimental Field Study of the Cognitive Tutor Geometry Curriculum, $1,255,961, U.S. Department of Education award R305F050122, Principal Investigator, 2005-2010.

Data Driven Decisionmaking in Southwestern Pennsylvania Schools, $132,000, Heinz Endowments and Grable Foundation, Principal Investigator, 2004-2006.

Evaluation of Math Science Partnership of Southwest Pennsylvania, $1,986,120, Allegheny Intermediate Unit, subcontract on National Science Foundation award EHR-0314914, subcontract Principal Investigator, 2003-2009.

Cognitive Tutor Curricula in Southwestern Pennsylvania, $28,330, School Performance Network, Principal Investigator, 2003-2004.

Evaluation of Quaker Valley Digital School District, $60,000, Quaker Valley School District, Principal Investigator, 2003.

Awards and Honors

Outstanding Reviewer, *Educational Researcher*, 2018.

RAND Distinguished Chair in Education Innovation, 2015 to 2018.

Most influential paper for important influences on VL/HCC research or commerce over the last 10 years by the 2012 IEEE Symposium on Visual Languages and Human-Centric Computing, for "Using HCI Techniques to Design a More Usable Programming System," Pane, Myers, & Miller (2002).

RAND Bronze Medal Awards, 2004 and 2007.

Supervision, Advising and Mentorship

Julia Szabo, Ph.D. candidate, Rice University, RAND Summer Intern, May to August 2023.

Adam Sales, Postdoctoral Fellow, Carnegie Mellon and RAND Traineeships in Methodology and Interdisciplinary Research (CMART), 2013-2015.

Andrea Bingham, Ph.D. candidate, University of Southern California Rossier School of Education, RAND Summer Intern, May to August 2014.

Sarah Ryan, Postdoctoral Fellow, Carnegie Mellon and RAND Traineeships in Methodology and Interdisciplinary Research (CMART), 2012-2014.

Julia Kaufman, Postdoctoral Fellow, Carnegie Mellon and RAND Traineeships in Methodology and Interdisciplinary Research (CMART), 2010-2012.

Rudolfo Angeles, Ph.D. candidate, Stanford University, Department of Statistics, RAND Summer Intern, June to September 2007.

Jennifer Steele, Ph.D. candidate, Harvard Graduate School of Education, RAND Summer Intern, June to September 2006.

Professional Activities

Certified reviewer for What Works Clearinghouse Group Design Standards, 2020-present.

Remake Learning Council, 2014 to 2025. The council provides strategic leadership to the Pittsburgh region's Remake Learning, which connects children with innovative learning programs in schools, museums, libraries, community centers, and online.

Research Advisory Board, Imagine Worldwide, 2018 to 2022. Imagine Worldwide seeks to leverage technology to empower children in developing countries to build literacy and numeracy skills.

Advisory Board, EdTech Evidence Exchange (EdTech Genome Project), 2019-2022.

Research Advisory Board, LEAP Innovations, 2016 to 2020. LEAP is a Chicago-based nonprofit organization connecting innovation and education.

Advisory Board, RAND Center for Causal Inference, 2015 to 2018. Core member 2019 to present.

Editorial Board, Journal of Research on Educational Effectiveness, 2020 to present.

Scientific Review Panel, Institute for Education Sciences, U.S. Department of Education: Mathematics and Science / STEM, 2008-12, 2014-17, 2021, 2023 (Panel Chair, 2011-12, 2014-15, 2021); Systematic Replication (2020, 2022); State Education Programs and Policies, 2015 (Panel Chair); Seedlings to Scale, 2024.

Invited Expert, Technical Working Group on Building Evidence: What Comes After an Efficacy Study?, Institute for Education Sciences, U.S. Department of Education, October 2016.

Program Chair, 2013 Fall Conference of the Society for Research on Educational Effectiveness.

Scientific Review Panel, National Science Foundation, REESE Program, 2012.

Invited Discussant, Improving Mathematics and Science Outcomes in Middle School, Institute for Education Sciences, U.S. Department of Education, March 2011.

Invited Scientific Advisor, Research Methods Meeting, Institute for Education Sciences, U.S. Department of Education, October 2010.

Member of Technical Working Group, Feasibility of an Experimental Study of Highly Selective Routes to Alternative Certification, Institute for Education Sciences, U.S. Department of Education, January 2008.

Chair, Graduate Student Consortium, IEEE Symposia on Visual Languages and Human-Centric Computing, 2004-2008.

Program committee, IEEE Symposia on Visual Languages and Human-Centric Computing, 2010.

Reviewer of proposals for the Spencer Foundation, 2009-2011.

Education research and evaluation consultant, Western Pennsylvania Educational Leadership Initiative, 2006-2007.

Software development and user interface consultant, 1986-1999. Clients included: Texas Instruments, Pratt Institute, Perceptics Corporation, City University of New York, and University of Pittsburgh.

Peer review of manuscripts: Journal of Research on Educational Effectiveness, Educational Researcher, Education Evaluation and Policy Analysis, Journal of Educational and Behavioral Statistics, Teachers College Record, AERA Open, American Journal of Education, Education Policy Analysis Archives, Cognitive Science, American Educational Research Association Annual Meeting, ACM Transactions on Computer-Human Interaction, International Journal of Human-Computer Studies, CHI Conference on Human Factors in Computing Systems, IEEE Symposia on Visual Languages and Human-Centric Computing, and Graphics Interface Conference.