

# Ryan Shaun Baker (formerly Ryan S.J.d. Baker)

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## RESEARCH INTERESTS

Educational Data Mining, Learning Analytics, Student Modeling (Disengagement, Affect, Robust Learning, Knowledge, Strategic Behavior, Meta-Cognition), Intelligent Tutoring Systems, MOOCs, Serious Games/Educational Games, Science Microworlds, Longitudinal Success, Prediction Modeling, Cultural Factors, Learner-Computer Interaction

## EDUCATION

**ScB.** Computer Science. Brown University. Graduated with Honors in Computer Science, May 2000.

**M.S.** Human-Computer Interaction. Carnegie Mellon University. Conferred August 9, 2005.

**Ph. D.** Human-Computer Interaction. Carnegie Mellon University. Conferred on December 22, 2005. Advisors: Kenneth R. Koedinger, Albert T. Corbett

**Executive Education.** Innovation and Entrepreneurship at Columbia Business School (IE@Columbia). Spring 2016.

## CURRENT APPOINTMENT

**Associate Professor.** Graduate School of Education. University of Pennsylvania. Summer 2016-present. Also Director of Penn Center for Learning Analytics. Secondary appointment in Computer and Information Science.

## OTHER CURRENT POSITIONS

**Editor.** *Computer-Based Learning in Context*. 2018-Present.

**Associate Editor.** *Journal of Educational Data Mining*. 2008-Present.

**Honorary Adjunct Associate Professor.** Department of Human Development. Teachers College, Columbia University. Summer 2016-Summer 2019.

**Research Fellow.** LINK Lab, University of Texas at Arlington. 2017-Present.

## PRIOR PROFESSIONAL EXPERIENCE

**Affiliate Assistant Professor.** Department of Social Science and Policy Studies. Worcester Polytechnic Institute. Fall 2013-2017.

**Honorary Fellow.** Moray House School of Education. University of Edinburgh. 2016-2017.

**Associate Professor.** Department of Human Development. Teachers College, Columbia University. Fall 2013-Summer 2016. Also **Program Coordinator** of MS in Learning Analytics.

**Julius and Rosa Sachs Distinguished Lecturer.** Teachers College, Columbia University. Fall 2012- Summer 2013.

**Assistant Professor of Psychology and Learning Science.** Department of Social Science and Policy Studies. Courtesy Appointment in Computer Science. Worcester Polytechnic Institute. Fall 2009 – Fall 2012.

**Technical Director.** Pittsburgh Science of Learning Center DataShop. Carnegie Mellon University. Fall 2008 – Summer 2009.

**Post Doctoral Fellow.** Human-Computer Interaction Institute/Pittsburgh Science of Learning Center. Carnegie Mellon University. Summer 2007 - Summer 2009. Mentor: Vincent Aleven

**Research Fellow.** Learning Sciences Research Institute. University of Nottingham. Spring 2006 – Spring 2007. Mentor: Shaaron Ainsworth.

**Post Doctoral Fellow.** Human-Computer Interaction Institute. Carnegie Mellon University. Winter 2006.

**Graduate Research Assistant/ Graduate Fellow.** Human-Computer Interaction Institute. Carnegie Mellon University. Advisors: Kenneth R. Koedinger, Albert T. Corbett. Fall 2000 – Fall 2005.

**Undergraduate Research Assistant.** JDSL (Data Structures Library in JAVA) Project. Computer Science Department. Brown University. Advisor: Roberto Tamassia. Summer 1997 – Spring 2000.

**Research Assistant.** LARC (Laboratory for Recreational Computing) Games Lab. Computer Science Department. University of North Texas. Advisor: Ian Parberry. Summer 1995– Spring 1996.

**Educational Software Developer.** Office of Education. Superconducting Super Collider Laboratory. Managers: Sam Kivlighn, Tom Gadsden. Summer 1992– Spring 1994.

## AWARDS

**Best Student Paper Award** (as co-author with Anthony Botelho). 11<sup>th</sup> International Conference on Educational Data Mining, 2018.

**Best Student Paper Award** (as co-author with Yang Jiang). 19<sup>th</sup> International Conference on Artificial Intelligence in Education, 2018.

**Best Paper Award.** 24<sup>th</sup> Conference on User Modeling, Adaptation, and Personalization, 2016.

**Best Student Paper Award** (as co-author with Shimin Kai). 8<sup>th</sup> International Conference on Educational Data Mining, 2015.

**Best Paper Award.** 17<sup>th</sup> International Conference on Artificial Intelligence in Education, 2015.

**Best Technical Paper Award.** 5<sup>th</sup> International Conference on Learning Analytics, 2015.

**Attendee Choice Award for Most Original Research.** 10<sup>th</sup> Annual Games+Learning+Society Conference Poster Session, 2014.

**Best Paper Award.** 11<sup>th</sup> International Conference on Intelligent Tutoring Systems, 2012.

**James Chen Best Student Paper Award** (as co-author with Michael Sao Pedro). 20<sup>th</sup> International Conference on User Modeling, Adaptation, and Personalization, 2012.

**AERA SIG-ATL Best Student Paper Award** (as co-author with Michael Sao Pedro). Annual Meeting of the American Educational Research Association, 2012.

**Nomination for Teaching Award.** Romeo L. Moruzzi Young Faculty Award for Innovation in Undergraduate Education, Worcester Polytechnic Institute. 2011.

**People's Choice Award for Best Oral Presentation.** 10<sup>th</sup> International Conference on Intelligent Tutoring Systems, 2010.

**People's Choice Award for Best Interactive Event.** 10<sup>th</sup> International Conference on Intelligent Tutoring Systems, 2010.

**Best Paper Award.** 8<sup>th</sup> International Conference on Intelligent Tutoring Systems, 2006.

**Senior Prize in Computer Science.** Brown University, 2000.

## GRANTS, PROJECT AWARDS, AND FELLOWSHIPS

**Office of Naval Research.** Toward Learning Analytics on US Navy Training Data. Baker, R.S. (PI). September 2017-August 2018. \$99,972. Award #N0014-17-1-2662.

**National Science Foundation, Discovery Research PreK-12.** Collaborative Research: Using Educational Data Mining Techniques to Uncover How and Why Students Learn from Erroneous Examples. Baker, R.S. (PI). June 2017-May 2020. \$584,644 (total grant across institutions \$1,498,736). Award #DRL-1661121.

**U.S. Department of Education, Institute of Education Sciences.** Using Automating Detectors of Engagement to Identify Malleable Factors in Blended Learning Environments. Heppen, J. (PI), Baker, R.S. (Co-PI). July 2017-June 2021. \$1,399,999. Award #R305A170167. Subcontract to UPenn: Using Automating Detectors of Engagement to Identify Malleable Factors in Blended Learning Environments. Baker, R.S. (subcontract lead). July 2017-June 2021. \$390,157.

**U.S. Department of Education, Institute of Education Sciences.**

Exploring Adaptive Cognitive and Affective Learning Support For Next-Generation STEM Learning Games. Shute, V. (PI), Baker, R.S. (Co-PI). July 2017-June 2021. \$1,399,996. Award #R305A170376. Subcontract to UPenn: Exploring adaptive cognitive and affective learning support for next-generation STEM learning games. Baker, R.S. (subcontract lead). July 2017-June 2021. \$429,826.

**National Science Foundation, Cyberlearning and Future Learning Technologies.** EXP: Linguistic Analysis and a Hybrid Human-Automatic Coach for Improving Math Identity. Ocumpaugh, J.L. (PI), Baker, R. S. (Co-PI) 2016-2019. \$540,047. Award #DRL-1739012.

**China Ministry of Education, Research Center of Online Education, Online Education Research Fund.** MOOC Interactive Online Learning to Engage the Public in Environmental Protection Action in the US and China. Krasny, Marianne (PI). Baker, Ryan (Co-PI). 2017 -2018. 100, 000 RMB, ~US \$14,490.

**National Science Foundation, Big Data Regional Innovation Hubs.** BD Spokes: Spoke: NORTHEAST: Collaborative: Grand Challenges for Data-Driven Education. Baker, R. S. (PI) 2016-2019. \$224,999. (Total grant across 3 institutions \$979,097). Award #DRL-1661987.

**National Science Foundation, EHR Core Research.** Collaborative Research: Using Data Mining and Observation to derive an enhanced theory of SRL in Science learning environments. Baker, R. S. (PI) 2016-2019. \$1,492,122. Award #DRL-1561567.

**U.S. Army Research Laboratory.** Integrating edX, GIFT, and CTAT. Aleven, V. (PI), Baker, R.S. (Co-PI). 2016-2019. \$650,757.

**Classba, Inc.** Classba Research Lab on Adaptive Learning at Teachers College, Columbia University. Baker, R.S. (PI) 2015-2016. \$108,851.

**National Science Foundation, EHR Core Research.** Collaborative Research: The Downside of Perseverance – Investigating and Moving Students Beyond Unproductive Persistence. Schechtman, N. (PI). Baker, R.S. (TC PI). 2015-2019. \$399,411. (Total grant across 3 institutions \$1,516,281). Award #DRL-1535340.

**Bill and Melinda Gates Foundation.** Digital Learning Research Network. Siemens, G. (PI). Baker, R. (Project member). 2015-2016. \$1,600,000.

**Subcontract to TC:** Digital Learning Research Network. Baker, R.S. (subcontract lead). 2015-2016. \$206,000.

**National Science Foundation, Data Intensive Research to Improve Teaching and Learning – An Ideas Lab to Foster Transformative Approaches to Teaching and Learning.**

Collaborative Research: Modeling Social Interaction and Performance in STEM Learning. Bergner, Y. (PI). Baker, R.S. (Co-PI). 2014-2017. \$774,447. Award #DRL-1418378.

**Subcontract to TC:** Collaborative Research: Modeling Social Interaction and Performance in STEM Learning. Baker, R.S. (subcontract lead). 2014-2017. \$185,320.

**Bill and Melinda Gates Foundation (via Athabasca University).** MOOC Learner Motivation and Course Completion Rates. Wang, Y.E. (PI), Baker, R.S.J.d. (Co-PI). 2013-2014. \$15,000.

**National Science Foundation, Research on Education and Learning (REAL).** Making Math Tutors More Engaging and Effective through Interaction Design Patterns and Educational Data

Mining. Baker, R.S.J.d. (PI). September 2013 – August 2017. \$1,480,949. Award #DRL-1252297.

**U.S. Army Research Laboratory.** Detection and Transition Analysis of Engagement and Affect in a Simulation-Based Combat Medic Training Environment. Baker, R.S.J.d. (PI). 2012-2015. \$958,093. Award #W911NF-13-2-0008.

**Bill and Melinda Gates Foundation, US Programs, Log File and Valence Studies of Education.** Modeling how Affect, Engagement, and Conscientiousness Interact and Influence Learning in Newton's Playground. Baker, R.S.J.d. (PI). 2012-2014. \$673,378. Award #OPP1060038.

**U.S. Department of Education, Institute of Education Sciences.** The Development of a Pedagogical Agent for Physical Science Inquiry Driven by Educational Data Mining. Gobert, J.G. (PI), Baker, R.S.J.d. (Co-PI). July 2012-June 2015. \$1,499,772. Award #R305A120778.

**Subcontract to TC:** The Development of a Pedagogical Agent for Physical Science Inquiry Driven by Educational Data Mining. Baker, R.S.J.d. (subcontract lead). July 2012-June 2015. \$304,679.

**Bill and Melinda Gates Foundation, US Program, Vital Behaviors and Skills Associated with Engagement Derived from Learning Analytics Topic.** Towards an Engagement Pedometer for Everyone: Unobtrusive Assessment of Engagement and Disengagement. Baker, R.S.J.d. (PI). 2011-2013. \$277,044. Award #OPP1048577.

**National Science Foundation, Software and Hardware Foundations (SHF).** SHF: Small: User Studies to Improve Novice Programming. Fisler, K. (PI), Baker, R.S.J.d. (Co-PI). 2011-2014. \$261,561. Award #CCF-1116539. REU Supplement \$16,000.

**U.S. Department of Education, Institute of Education Sciences.** Classroom Environment, Allocation of Attention, and Learning Outcomes in K-4 Students. Fisher, A. (PI), Baker, R.S.J.d. (Co-PI). 2011-2015. \$1,571,973. Award #R305A110444.

**Subcontract to WPI:** Classroom Environment, Allocation of Attention, and Learning Outcomes in K-4 Students. Baker, R.S.J.d. (subcontract lead). 2011-2015. \$ 326,099. (\$66,211 spent before transfer to TC)

**Subcontract to TC:** Classroom Environment, Allocation of Attention, and Learning Outcomes in K-4 Students. Baker, R.S.J.d. (subcontract lead). 2011-2015. \$ 259,888.

**National Science Foundation, Innovative Technology Experiences for Students and Teachers (ITEST).** Research: Predicting STEM Career Choice from Computational Indicators of Student Engagement within Middle School Mathematics Classes. Baker, R.S.J.d. (PI), Heffernan, N.T. (Co-PI). June 2011 – May 2016. \$711,609. Award #DRL-1031398.

**Subcontract to TC:** Research: Predicting STEM Career Choice from Computational Indicators of Student Engagement within Middle School Mathematics Classes. Baker, R.S.J.d. (PI). 2012-2014. \$366,210.

**National Science Foundation, Research and Evaluation on Education in Science and Engineering (REESE).** Empirical Research: Emerging Research: Using Automated Detectors to Examine the Relationships Between Learner Attributes and Behaviors During Inquiry in Science Microworlds. Gobert, J.G. (PI), Baker, R.S.J.d. (Co-PI). October 2010 – September 2015. \$986,111. Award #DRL-1008649.

**Subcontract to TC:** Empirical Research: Emerging Research: Using Automated

Detectors to Examine the Relationships Between Learner Attributes and Behaviors During Inquiry in Science Microworlds. Baker, R.S.J.d. (subcontract lead). 2012-2013. \$79,566.

**National Science Foundation, Research and Evaluation on Education in Science and Engineering (REESE).** Empirical Research: Emerging Research: Robust and Efficient Learning: Modeling and Remediating Students' Domain Knowledge. Corbett, A.T. (PI), Baker, R.S.J.d. (Co-PI). July 2009 – June 2013. \$1,066,102. Award # DRL-0910188.

**Subcontract to WPI:** Empirical Research: Emerging Research: Robust and Efficient Learning: Modeling and Remediating Students' Domain Knowledge. Baker, R.S.J.d. (subcontract lead). 2009-2012. \$161,781.

**U.S. Department of Education, Institute of Education Sciences.** Promoting Robust Understanding of Genetics with a Cognitive Tutor that Integrates Conceptual Learning with Problem Solving. Corbett, A.T. (PI), Baker, R.S.J.d. (Co-PI). 2009-2013. \$1,422,468. Award # R305A090549.

**Subcontract to WPI:** Promoting Robust Understanding of Genetics with a Cognitive Tutor that Integrates Conceptual Learning with Problem Solving. Baker, R.S.J.d. (subcontract lead). 2009-2012. \$265,957.

**National Science Foundation, Science of Learning Centers.** Toward a Decade of PSLC Research: Investigating Instructional, Social, and Learner Factors in Robust Learning through Data-Driven Analysis and Modeling. Koedinger, K.R. (PI). Baker, R.S.J.d. (Senior Personnel). February 2010- January 2015. \$25,000,000. Award # SBE-0836012.

**Subcontract to WPI:** PSLC Projects in Affect Detection and Closing the Loop on Gaming the System. Baker, R.S.J.d. (subcontract lead). 2010-2012. \$316,960.

**Subcontract to TC:** PSLC Projects in Affect, Gaming the System, and Robust Learning. Baker, R.S.J.d. (subcontract lead). 2012-2013. \$144,096.

**Pittsburgh Science of Learning Center Project Award.** Improving Student Affect Through Adding Gaming Elements to Mathematics LearnLabs. Alevan, V. (PI). Baker, R.S.J.d. (co-PI). August 2008 - September 2009. \$104,901.

**Pittsburgh Science of Learning Center Project Award.** Geometry Greatest Hits. Alevan, V (PI). Baker, R.S.J.d. (co-PI). August 2008 - September 2009. \$101,861.

**Pittsburgh Science of Learning Center Project Award.** How Content and Interface Features Influence Student Choices Within the Learning Space. Baker, R.S.J.d. (PI). July 2007 - July 2008. \$73,718.

**Kaleidoscope Initiative.** A Centralized Research Data Repository. Melis, E. (PI), Baker, R. (co-PI). March-December 2007. €15,000.

**National Defense Science and Engineering Graduate Fellowship.** American Society of Engineering Education/Department of Defense. Fall 2001- Spring 2004.

## COURSES TAUGHT

**Big Data and Education.** Taught on edX for University of Pennsylvania. Spring 2018.

**Big Data, Education, and Society. Graduate School of Education, University of Pennsylvania.**

Spring 2018.

**Foundations of Teaching and Learning. Graduate School of Education, University of Pennsylvania.**

Fall 2017.

**Big Data and Education.** Taught on edX for University of Pennsylvania.

Summer 2017. Enrollment of 4,230 students at time of course end.

**Core Methods in Educational Data Mining. Graduate School of Education, University of Pennsylvania.**

Spring 2017.

**Foundations of Teaching and Learning. Graduate School of Education, University of Pennsylvania.**

Fall 2016.

**Learning Analytics: Process & Theory.** Department of Human Development, Teachers College, Columbia University. Concurrently for Moray House School of Education, University of Edinburgh. (Co-taught with Dragan Gasevic)

Spring 2016.

**Technology & Human Development.** Department of Human Development, Teachers College, Columbia University.

Spring 2016

**Core Methods in Educational Data Mining.** Department of Human Development, Teachers College, Columbia University.

Fall 2015 (student course evals: 4.6/5.0)

**Big Data and Education.** Taught on edX for Teachers College, Columbia University.

Summer 2015. Enrollment of 10,348 students at time of course end.

**Probability and Statistical Inference.** Department of Human Development, Teachers College, Columbia University.

Spring 2015 (student course evals: 4.6/5.0; 2014 average for this course was 3.5)

**Feature Engineering Studio.** Department of Human Development, Teachers College, Columbia University.

Spring 2015 (student course evals: 4.3/5.0)

**Core Methods in Educational Data Mining.** Department of Human Development, Teachers College, Columbia University.

Fall 2014 (student course evals: 3.8/5.0)

**Data, Analytics, and Learning.** Taught on EdX for University of Texas, Arlington, in coordination with George Siemens, Dragan Gasevic, and Carolyn Rosé. Fall 2014.

Enrollment of 25,186 students at time of course end.

**Learning Analytics: Process and Theory.** Department of Human Development, Teachers College, Columbia University.

Spring 2014 (student course evals: 4.7/5.0; univ. average 4.2)

**Big Data and Education.** Taught on Coursera for Teachers College, Columbia University.

Fall 2013. Enrollment of 44,151 students (as of 12/12/2013)

**Feature Engineering Studio.** Department of Human Development, Teachers College, Columbia University.

Fall 2013 (student course evals: 4.5/5.0)

**Special Topics in Educational Data Mining.** Department of Human Development, Teachers College, Columbia University.

Spring 2013 (student course evals: 4.3/5.0)

**Advanced Methods and Analysis for the Learning and Social Sciences.** Department of Social Sciences and Policy Studies, Worcester Polytechnic Institute.

Spring 2012. (student course evals: 4.86/5.0)

**Cognitive Psychology.** Department of Social Sciences and Policy Studies, Worcester Polytechnic Institute.

Fall 2011, A term. (student course evals: 4.13/5.0; univ. avg. for ugrad classes 4.10)

Fall 2010, B term. (student course evals: 4.22/5.0; univ. avg. for ugrad classes 4.04)

**Meta-Cognition, Motivation, and Affect.** Department of Social Sciences and Policy Studies, Worcester Polytechnic Institute.

Spring 2011. (student course evals: 4.5/5.0; univ. avg. for grad classes 4.22)

**Educational Psychology.** (taught as ISP). Department of Social Sciences and Policy Studies, Worcester Polytechnic Institute.

Spring 2011, D term. (student course evals not collected)

Fall 2010, A term. (student course evals not collected)

**Research Methods for the Learning Sciences** (taught as ISP). Department of Social Sciences and Policy Studies, Worcester Polytechnic Institute.

Spring 2010, C term. (student course evals: 5.0/5.0; univ. avg. for grad classes 4.20)

**Learning and Motivation.** Co-taught with Vincent Aleven. Human-Computer Interaction Institute and Department of Psychology, Carnegie Mellon University. Spring 2009.

**Design e Comunicação na Web.** (Design and Communication on the Web). Programa de Pós-Graduação em Engenharia de Software (Software Engineering Post-Graduate Program). Faculdade de Alagoas (Alagoas College). December 2008.

**Research Methods for the Learning Sciences.** Co-taught with Kenneth R. Koedinger. Human-Computer Interaction Institute, Carnegie Mellon University. Spring 2008.

**Learning and Technology.** Co-taught with Claire O'Malley. Learning Sciences Research Institute, University of Nottingham. Spring 2007.



**Human-Computer Interaction for Computer Scientists.** Co-taught with Kenneth R. Koedinger, Jacob Wobbrock, and A. Fleming Seay. Human-Computer Interaction Institute, Carnegie Mellon University. Spring 2004.

## PUBLICATIONS

**Total citations: 11,861 (Google Scholar, October 24, 2018)**

**h-index: 49 (Google Scholar, October 24, 2018)**

**Most cited paper:** (Baker & Yacef, 2009)  
**(1,160 citations – Google Scholar, October 24, 2018)**

**Number of distinct co-authors on published papers: 336**

**Full list of citations per paper:** <http://scholar.google.com/citations?hl=en&user=hvs8PEoAAAAJ>

**ORCID:** 0000-0002-3051-3232

### Journal Papers

Jiang, Y., Clarke-Midura, J., Keller, B., Baker, R.S., Paquette, L., Ocumpaugh, J. (2018) Note-taking and science inquiry in an open-ended learning environment. *Contemporary Educational Psychology*, 55, 12-29.

Salmeron-Majadas, S., Baker, R.S., Santos, O.C., Boticario, J.G. (2018) A Machine Learning Approach to Leverage Individual Keyboard and Mouse Interaction Behavior from Multiple Users in Real-World Learning Scenarios. *IEEE Access*, 39154-39179.

Reid, J., Baker, R.S. (2018) Designing and Testing an Educational Innovation. *Pediatric Radiology*, 48 (10), 1406-1409.

Kai, S., Almeda, M.V., Baker, R.S., Heffernan, C., Heffernan, N. (2018) Decision Tree Modeling of Wheel-Spinning and Productive Persistence in Skill Builders. *Journal of Educational Data Mining*, 10 (1), 36-71.

Wang, Y., Baker, R.S. (2018) Grit and intention: why do learners complete MOOCs? *The International Review of Research in Open and Distributed Learning*, 19 (3).

DeFalco, J., Rowe, J.P., Paquette, L., Georgoulas-Sherry, V., Brawner, J., Mott, B.W., Baker, R.S., Lester, J.C. (2018) Detecting and Addressing Frustration in a Serious Game for Military Training. *International Journal of Artificial Intelligence and Education*, 28 (2), 152-193.

Sottolare, R.A., Baker, R.S., Graesser, A.C., Lester, J.C. (2018) Special Issue on the Generalized Intelligent Framework for Tutoring (GIFT): Creating a Stable and Flexible Platform for Innovations in AIED Research. *International Journal of Artificial Intelligence and Education*, 28 (2), 139-151.

Almeda, M.V., Zuech, J. Baker, R.S., Utz, C., Higgins, G., Reynolds, R. (2018) Do The Same

Factors Predict Success among For-Credit and Open/MOOC students in Online Learning? *Online Learning Journal*, 22 (1).

Baker, R., Wang, F., Ma, Z., Ma, W., Zheng, S. (2018) Studying the Effectiveness of an Online Language Learning Platform in China. *Journal of Interactive Learning Research*, 29 (1), 5-24.

Andres, J.M.L., Baker, R.S., Siemens, G., Gasevic, D., Spann, C.A. (2017) Replicating 21 Findings on Student Success in Online Learning. *Technology, Instruction, Cognition, and Learning*, 10 (4), 313-333.

San Pedro, M.O., Baker, R.S., Heffernan, N.T. (2017) An Integrated Look at Middle School Engagement and Learning in Digital Environments as Precursors to College Attendance. *Technology, Knowledge and Learning*, 22 (3), 243-273.

Asbell-Clarke, J., Baker, R., Eagle, M., Hicks, A., Barnes, T., Brown, R., Edwards, T. (2017) Assessing Implicit Science Learning in Digital Games. *Computers in Human Behavior*, 76, 617-630.

Almeda, V., Baker, R., Corbett, A. (2017) Help Avoidance: When Students Should Seek Help, and the Consequences of Failing to Do So. *Teachers College Record*, 117 (3).

Slater, S., Joksimovic, S., Kovanovic, V., Baker, R.S., Gasevic, D. (2017) Tools for Educational Data Mining: A Review. *Journal of Educational and Behavioral Statistics*, 42 (1), 85-106.

Bosch, N., D'Mello, S.K., Ocumpaugh, J., Baker, R.S., Shute, V. (2016) Using video to automatically detect learner affect in computer-enabled classrooms. *ACM Transactions on Interactive Intelligent Systems (TiiS)*, 6(2).

Ocumpaugh, J., San Pedro, M.O., Lai, H-y., Baker, R.S., Borgen, F. (2016) Middle School Engagement with Mathematics Software and Later Interest and Self-Efficacy for STEM Careers. *Journal of Science Education and Technology*, 25 (6), 877-887.

Godwin, K.E., Almeda, M.V., Seltman, H., Kai, S., Skerbetz, M.D., Baker, R.S., Fisher, A.V. (2016) Off-task Behavior in Elementary School Children. *Learning and Instruction*, 44, 128-143.

Baker, R.S. (2016) Stupid Tutoring Systems, Intelligent Humans. *International Journal of Artificial Intelligence and Education*, 26 (2), 600-614.

Baker, R., Clarke-Midura, J., Ocumpaugh, J. (2016) Toward General Models of Effective Science Inquiry in Virtual Performance Assessments. *Journal of Computer Assisted Learning*, 32 (3), 267-280.

Kovanovic, V. Gasevic, D., Dawson, S., Joksimovic, S., Baker, R.S., Hatala, M. (2015) Does Time-on-task Estimation Matter? Implications on Validity of Learning Analytics Findings. *Journal of Learning Analytics*, 2 (3).

Mulqueeny, K., Kostyuk, V., Baker, R.S., Ocumpaugh, J. (2015) Incorporating Effective e-Learning Principles to Improve Student Engagement in Middle-School Mathematics. *International Journal of STEM Education*, 2 (15).

Shute, V.J., D'Mello, S., Baker, R., Cho, K., Bosch, N., Ocumpaugh, J., Ventura, M., Almeda, V. (2015) Modeling how incoming knowledge, persistence, affective states, and in-game progress influence student learning from an educational game. *Computers & Education*, 86, 224-235.

Comer, D., Baker, R., Wang, Y. (2015) Negativity in Massive Online Open Courses: Impacts on Learning and Teaching. *InSight: A Journal of Scholarly Teaching*, 10.

Ogan, A., Walker, E., Baker, R., Rodrigo, M.M.T., Soriano, J.C., Castro, M.J. (2015) Towards Understanding How to Assess Help-Seeking Behavior Across Cultures. *International Journal of Artificial Intelligence in Education*, 25 (2), 229-248.

Gobert, J.D., Baker, R.S., Wixon, M.B. (2015) Operationalizing and Detecting Disengagement Within Online Science Microworlds. *Educational Psychologist*, 50 (1), 43-57.

Wang, Y. Baker, R. (2015) Content or Platform: Why do students complete MOOCs? *MERLOT Journal of Online Learning and Teaching*, 11 (1), 17-30.

Wang, Y.E., Paquette, L., Baker, R. (2014) A Longitudinal Study on Learner Career Advancement in MOOCs. *Journal of Learning Analytics*, 1 (3), 203-206.

Roll, I., Baker, R.S.Jd., Aleven, V., Koedinger, K.R. (2014) On the Benefits of Seeking (and Avoiding) Help in Online Problem-Solving Environments. *Journal of the Learning Sciences*, 23 (4), 537-560.

Baker, R.S., Corbett, A.T. (2014) Assessment of Robust Learning with Educational Data Mining. *Research & Practice in Assessment*, 9, 38-50.

Baker, R.S. (2014) Educational Data Mining: An Advance for Intelligent Systems in Education. *IEEE Intelligent Systems*, 29 (3), 78-82.

Berland, M., Baker, R.S., Blikstein, P. (2014) Educational data mining and learning analytics: Applications to constructionist research. *Technology, Knowledge, and Learning*, 19, 205-220.

Miller, W.L., Baker, R.S., Rossi, L.M. (2014) Unifying Computer-Based Assessment Across Conceptual Instruction, Problem-Solving, and Digital Games. *Technology, Knowledge, and Learning*, 19, 165-181.

Pardos, Z.A., Baker, R.S., San Pedro, M.O.C.Z., Gowda, S.M., Gowda, S.M. (2014) Affective states and state tests: Investigating how affect and engagement during the school year predict end of year learning outcomes. *Journal of Learning Analytics*, 1 (1), 107-128.

Ocumpaugh, J., Baker, R., Gowda, S., Heffernan, N., Heffernan, C. (2014) Population validity for Educational Data Mining models: A case study in affect detection. *British Journal of Educational Technology*, 45 (3), 487-501.

San Pedro, M.O.Z., Baker, R.S.J.d., Rodrigo, M.M.T. (2014) Carelessness and Affect in an Intelligent Tutoring System for Mathematics. *International Journal of Artificial Intelligence in Education*, 24, 189-210.

Baker, R.S.J.d., Corbett, A.T., Gowda, S.M. (2013) Generalizing Automated Detection of the Robustness of Student Learning in an Intelligent Tutor for Genetics. *Journal of Educational Psychology*, 105 (4), 946-956.

Rodrigo, M.M.T., Baker, R.S.J.d., Rossi, L. (2013) Student Off-Task Behavior in Computer-Based Learning in the Philippines: Comparison to Prior Research in the USA. *Teachers College Record*, 115 (10), 1-27.

Porayska-Pomsta, K., Mavrikis, M., D'Mello, S., Conati, C., Baker, R.S.J.d. (2013) Knowledge Elicitation Methods for Affect Modeling in Education. *International Journal of Artificial Intelligence in Education*, 22 (3), 107-140.

Baker, R.S.J.d., Hershkovitz, A., Rossi, L.M., Goldstein, A.B., Gowda, S.M. (2013) Predicting Robust Learning With the Visual Form of the Moment-by-Moment Learning Curve. *Journal of the Learning Sciences*, 22 (4), 639-666.

Gobert, J.D., Sao Pedro, M., Raziuddin, J., Baker, R. (2013) From Log Files to Assessment Metrics: Measuring Students' Science Inquiry Skills Using Educational Data Mining. *Journal of the Learning Sciences*, 22 (4), 521-563.

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- Miller, W.L., Baker, R., Labrum, M., Petsche, K., Liu, Y-H., Wagner, A. (2015) Automated Detection of Proactive Remediation by Teachers in Reasoning Mind Classrooms. *Proceedings of the 5th International Learning Analytics and Knowledge Conference*, 290-294.
- Andres, J.M., Rodrigo, M.M.T., Sugay, J.O., Baker, R.S., Paquette, L., Shute, V.J., Ventura, M., Small, M. (2014) An Exploratory Analysis of Confusion Among Students Using Newton's Playground. *Proceedings of the 22nd International Conference on Computers in Education*.
- San Pedro, M.O.Z., Ocumpaugh, J.L., Baker, R.S., Heffernan, N.T. (2014) Predicting STEM and Non-STEM College Major Enrollment from Middle School Interaction with Mathematics Educational Software. *Proceedings of the 7th International Conference on Educational Data Mining*, 276-279.
- Paquette, L., de Carvalho, A.M.J.A., Baker, R.S., Ocumpaugh, J. (2014) Reengineering the Feature Distillation Process: A Case Study in the Detection of Gaming the System. *Proceedings of the 7th International Conference on Educational Data Mining*, 284-287.
- Baker, R.S., Ocumpaugh, J. (2014) Cost-Effective, Actionable Engagement Detection at Scale. *Proceedings of the 7th International Conference on Educational Data Mining*, 345-346.

Hsiao, I-H., Chae, H.S., Malhotra, M., Baker, R.S.J.d., Natriello, G. (2014) Exploring Engaging Dialogues in Video Discussions. *Proceedings of the 7th International Conference on Educational Data Mining*, 363-364.

Rowe, E., Baker, R.S., Asbell-Clarke, J., Kasman, E., Hawkins, W.J. (2014) Building Automated Detectors of Gameplay Strategies to Measure Implicit Science Learning. *Proceedings of the 7th International Conference on Educational Data Mining*, 337-338.

Hawkins, W.J., Heffernan, N.T., Baker, R.S.J.d. (2014) Learning Bayesian Knowledge Tracing Parameters with a Knowledge Heuristic and Empirical Probabilities. *Proceedings of the 12th International Conference on Intelligent Tutoring Systems*, 150-155.

Stephenson, S., Baker, R., Corrigan, S. (2014) Towards Building an Automated Detector of Engaged and Disengaged Behavior in Game-Based Assessments. Poster presented at the *10th Annual Conference on Games+Learning+Society*. **[Won Attendee Choice Award for Most Original Research]**.

Almeda, M.V., Scupelli, P., Baker, R.S., Weber, M., Fisher, A. (2014) Clustering of Design Decisions in Classroom Visual Displays. *Proceedings of the 4th International Conference on Learning Analytics and Knowledge*, 44-48.

Godwin, K.E., Almeda, M.V., Petroccia, M., Baker, R.S., Fisher, A.V. (2013) Classroom activities and off-task behavior in elementary school children. Poster paper. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 2428-2433.

Corbett, A., MacLaren, B., Wagner, A., Kauffman, L., Mitchell, A., Baker, R. (2013) Enhancing Robust Learning through Problem Solving in the Genetics Cognitive Tutor. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 2094-2099.

Hershkovitz, A., Baker, R.S.J.d., Moore, G.R., Rossi, L.M., van Velsen, M. (2013) The Interplay between Affect and Engagement in Classrooms Using AIED Software. *Proceedings of the 16th International Conference on Artificial Intelligence and Education*, 587-590.

Ocuppaugh, J., Baker, R.S.J.d., Gaudino, S., Labrum, M.J., Dezendorf, T. (2013) Field Observations of Engagement in Reasoning Mind. *Proceedings of the 16th International Conference on Artificial Intelligence and Education*, 624-627.

Baker, R.S.J.d., Ocuppaugh, J.L., Gowda, S.M., Gowda, S.M., Heffernan, N.T. (2013) Ensuring Reliability of Educational Data Mining Detectors for Diverse Populations of Learners. Presentation at *CREA: Center for Culturally Responsive Evaluation and Assessment: Inaugural Conference*. Published as Extended Abstract.

Sao Pedro, M.A., Baker, R.S.J.d., Gobert, J.D. (2013) What Different Kinds of Stratification Can Reveal about the Generalizability of Data-Mined Skill Assessment Models. *Proceedings of the 3rd International Conference on Learning Analytics and Knowledge*, 190-194.

Rodrigo, M.M.T., Baker, R.S.J.d., McLaren, B., Jayme, A., Dy, T. (2012) Development of a Workbench to Address the Educational Data Mining Bottleneck. *Proceedings of the 5th International Conference on Educational Data Mining*, 152-155.

Soriano, J.C.A., Rodrigo, M.M.T., Baker, R.S.J.d., Ogan, A., Walker, E., Castro, M.J., Genato, R., Fontaine, S., Belmontez, R. (accepted) A Cross-Cultural Comparison of Effective Help-Seeking Behavior among Students Using an ITS for Math. Poster paper. *Proceedings of the International Conference on Intelligent Tutoring Systems*, 636-637.

Roberge, D., Rojas, A., Baker, R.S.J.d. (2012) Does the Length of Time Off-Task Matter? *Proceedings of the 2<sup>nd</sup> International Conference on Learning Analytics and Knowledge*.

Siemens, G., Baker, R.S.J.d. (2012) Learning Analytics and Educational Data Mining: Towards Communication and Collaboration. *Proceedings of the 2<sup>nd</sup> International Conference on Learning Analytics and Knowledge*. **(328 citations – Google Scholar, February 19, 2017)**

Hershkovitz, A., Baker, R.S.J.d., Gobert, J., Wixon, M. (2011) Goal Orientation and Changes of Carelessness over Consecutive Trials in Science Inquiry. Poster paper. *Proceedings of the 4<sup>th</sup> International Conference on Educational Data Mining*, 315-316.

Walker, E., Ogan, A., Baker, R.S.J.d., de Carvalho, A., Laurentino, T., Rebolledo-Mendez, G., Castro, M.J. (2011) Observations of Collaboration in Cognitive Tutor Use in Latin America. Poster paper. *Proceedings of the 15<sup>th</sup> International Conference on Artificial Intelligence in Education*, 575-577.

Hershkovitz, A., Wixon, M., Baker, R.S.J.d., Gobert, J., Sao Pedro, M. (2011) Carelessness and Goal Orientation in a Science Microworld. Poster paper. *Proceedings of the 15<sup>th</sup> International Conference on Artificial Intelligence in Education*, 462-465.

Stamper, J., Koedinger, K., Baker, R., Skogsholm, A., Leber, B., Demi, S., Yu, S., Spencer, D. (2011) Managing the Educational Dataset Lifecycle with Datashop. Poster paper. *Proceedings of the 15<sup>th</sup> International Conference on Artificial Intelligence in Education*, 557-559.

Rodrigo, M.M.T., Baker, R.S.J.d., Nabos, J. (2010) The Relationships Between Sequences of Affective States and Learner Achievement. *Proceedings of ICCE 2010, the 18<sup>th</sup> International Conference on Computers in Education*.

Rodrigo, M.M.T., Baker, R.S.J.d., Agapito, J., Nabos, J., Repalam, M.C., Reyes, S.S. (2010) Comparing Disengaged Behavior within a Cognitive Tutor in the USA and Philippines. *Proceedings of the 10<sup>th</sup> Annual Conference on Intelligent Tutoring Systems*, 263-265.

Giguere, S., Beck, J., Baker, R. (2010) Analyzing Student Gaming with Bayesian Networks. *Proceedings of the 10<sup>th</sup> Annual Conference on Intelligent Tutoring Systems*, 321-323.

Baker, R.S., Corbett, A., Koedinger, K., Roll, I. (2005) Detecting When Students Game The System, Across Tutor Subjects and Classroom Cohorts. *Proceedings of User Modeling 2005*, 220-224.

Baker, R.S., Wagner, A.Z., Corbett, A.T., Koedinger, K.R. (2004) The Social Role of Technical Personnel in the Deployment of Intelligent Tutoring Systems. *Proceedings of 7<sup>th</sup> International Conference on Intelligent Tutoring Systems*, 785-787.

Roll, I., Baker, R.S., Aleven, V., Koedinger, K.R. (2004) A Metacognitive ACT-R model of Students' Learning Strategies in Intelligent Tutoring Systems. *Proceedings of 7<sup>th</sup> International Conference on Intelligent Tutoring Systems*, 854-856.

Roll, I., Baker, R.S., Aleven, V., Koedinger, K.R. (2004) What goals do students have when choosing the actions they perform? *Proceedings of 6<sup>th</sup> International Conference on Cognitive Modeling*, 380-381.

Dabbish L.A., Baker R.S. (2003) Administrative Assistants as Interruption Mediators. *ACM CHI: Computer-Human Interaction*, 1020-1021.

### **Edited Books**

Romero, C., Ventura, S., Pechenizkiy, M., Baker, R.S.J.d. (Eds.) (2010) *Handbook of Educational Data Mining*. Boca Raton, FL: CRC Press.

### **Edited Proceedings**

Andre, E., Baker, R., Hu, X., Rodrigo, M.M.T., du Boulay, B. (Eds.) (2017) *Proceedings of the 18<sup>th</sup> International Conference on Artificial Intelligence and Education*. Wuhan, China. July 2017.

Baker, R.S.J.d., Merceron, A., Pavlik, P.I. (Eds.) (2010) *Educational Data Mining 2010: 3<sup>rd</sup> International Conference on Educational Data Mining, Proceedings*. Pittsburgh, PA, USA. June 2010.

Baker, R.S.J.d., Barnes, T., Beck, J.E. (Eds.) (2008) *Educational Data Mining 2008: 1<sup>st</sup> International Conference on Educational Data Mining, Proceedings*. Montreal, Quebec, Canada. June 2008.

Baker, R.S.J.d., Beck, J., Berendt, B., Kroner, A., Menasalvas, E., Weibelzahl, S. (Eds.) (2007) *Complete On-Line Proceedings of the Workshop on Data Mining for User Modeling, at the 11th International Conference on User Modeling (UM 2007)*. Corfu, Greece. June 2007.

Heiner, C., Baker, R., Yacef, K. (Eds.) (2006) *Proceedings of the Workshop on Educational Data Mining, at the 8th International Conference on Intelligent Tutoring Systems*. Jhongli, Taiwan. July 2006.

### **Technical Reports**

Medvedeva, O., de Carvalho, A.M.J.B., Baker, R.S.J.d., Crowley, R.S. (2013) A classifier to detect student 'gaming' of a medical education system. Technical Report. New York, NY: Educational Data Mining Laboratory.

Porayska-Pomsta, K., Mavrikis, M., D'Mello, S., Conati, C., Baker, R. (2011) Contemporary Methods for Affect-Related Knowledge Discovery and Emotion Measurement in Learning. Cognitive Science Research Paper, Department of Informatics, University of Sussex.

Baker, R.S., Wagner, A.Z., Corbett, A.T., Koedinger, K.R. (2004) The Social Role of Technical Personnel in the Deployment of Intelligent Tutoring Systems. *CMU Technical Report CMU-HCII-04-100*, July 2004.



## Workshop Papers/Presentations

Shechtman, N., Feng, M., Heffernan, N. & Baker, R. (2018). Clarification of the Wheel-Spinning Effect: One System, Two Contrasting Conclusions. Presentation at the 2018 *Replication.Education Workshop* held at the International Conference on Educational Data Mining. Buffalo, NY. July 2018.

Baker, R., Coleman, C. (2018) Standardizing Modeling of User Behaviors: Which Behaviors Matter? *Proceedings of the Adaptive Instructional Systems Standards Workshop*.

Wang, Y.E., Baker, R., Paquette, L. (2017) Behavioral Predictors of MOOC Post-Course Development. *Proceedings of the Workshop on Integrated Learning Analytics of MOOC Post-Course Development*.

Brooks, C., Baker, R., Andres, J.M.L. (in press) Infrastructure for Replication in Learning Analytics. To appear in *Proceedings of the Workshop of the Methodology in Learning Analytics Bloc*.

Andres, J.M., Rodrigo, M.M.T., Baker, R., Paquette, L., Shute, V., Ventura, M. (2015) Analyzing Student Action Sequences and Affect While Playing Physics Playground. *Proceedings of the International Workshop on Affect, Meta-Affect, Data and Learning*, 24-33.

Brown, R., Lynch, C., Wang, Y., Eagle, M., Albert, J., Barnes, T., Baker, R., Bergner, Y., McNamara, D. (2015) Communities of Performance & Communities of Preference. *Proceedings of the Graph Analytics Workshop at the International Educational Data Mining (EDM) Conference*.

Baker, R.S., DeFalco, J.A., Paquette, L., Georgoulas, V., Rowe, J., Mott, B., Lester, J. (2015) Motivational Feedback Designs for Frustration in a Simulation-based Combat Medic Training Environment. *Proceedings of the 3<sup>rd</sup> Annual GIFT Users Symposium*, 81-88.

Miller, W.L., Baker, R.S., Labrum, M.J., Petsche, K., Wagner, A.Z. (2014) Boredom Across Activities, and Across the Year, within Reasoning Mind. *Proceedings of the Workshop on Data Mining for Educational Assessment and Feedback*.

Ocuppaugh, J., Baker, R.S., Kamarainen, A.M., Metcalf, S.J. (2014) Modifying Field Observation Methods on the Fly: Metanarrative and Disgust in an Environmental MUVE. *Proceedings of the 4<sup>th</sup> International Workshop on Personalization Approaches in Learning Environments (PALE)*, 49-54.

DeFalco, J.A., Baker, R.S.J.d. (2013) Detection and Transition Analysis of Engagement and Affect in a Simulation-based Combat Medic Training Environment. *Proceedings of the AIED 2013 Workshop on GIFT*.

Gowda, S., Baker, R.S.J.d., Pardos, Z., Heffernan, N. (2011) The Sum is Greater than the Parts: Ensembling Student Knowledge Models in ASSISTments. *Proceedings of the KDD 2011 Workshop on KDD in Educational Data*.

Baker, R.S.J.d. (2007) Is Gaming the System State-or-Trait? Educational Data Mining Through the Multi-Contextual Application of a Validated Behavioral Model. *Complete On-Line Proceedings of the Workshop on Data Mining for User Modeling at the 11th International Conference on User Modeling 2007*, 76-80.

Baker, R.S.J.d., Corbett, A.T., Wagner, A.Z. (2006) Human Classification of Low-Fidelity Replays of Student Actions. *Proceedings of the Workshop on Educational Data Mining at the 8<sup>th</sup> International Conference on Intelligent Tutoring Systems*, 29-36.

### **Theses**

Baker, R.S. (2005) Designing Intelligent Tutors That Adapt to When Students Game the System. Doctoral Dissertation. Advisors: Kenneth R. Koedinger, Albert T. Corbett

Baker, R.S. (2000) PILOT: An Interactive Tool for Learning and Grading. Senior Honors Thesis, Brown University. Advisors: Roberto Tamassia, Thomas Dean.

### **Other Participation at Workshops or Conferences**

Baker, R.S. (2018) Participation in panel A Look into the Future: Contributions from our Societies. London Festival of Learning. London, UK.

Baker, R.S. (2018) Participation in panel Measuring the Impact of Innovative Technologies in Education. International Conference on the Learning Sciences. London, UK.

Baker, R.S. (2017) Participation in panel Learning Analytics. Reimagine Education 2017. Philadelphia, PA.

Baker, R.S. (2017) Participation in panel Technology in Education. 4<sup>th</sup> Annual NAEP Innovations Symposium. Washington, DC.

Baker, R.S. (2017) Presentation in panel How is Learning Science Research Advancing Innovation in Teaching and Learning? Educause Annual Conference. Philadelphia, PA.

Wang, Y., Baker, R.S. (2017) Beyond Sampling: Exploring how students use MOOCs minimally. Presentation at the 4<sup>th</sup> Learning with MOOCs Conference. Austin, TX.

Baker, R.S. (2017) Boredom Detection using Data. Presentation at the Northern Kentucky University Research and Innovation Symposium in Education. Highland Heights, KY.

Baker, R.S. (2017) Ethical, Privacy, and Practical Limitations for Learning Analytics. Presentation at the DIMACS/Northeast Big Data Hub Workshop on Privacy and Security for Big Data. Piscataway, NJ.

Baker, R.S. (2017) Building a Masters Level Program. Invited Presentation at the Building the Learning Analytics Curriculum Workshop, LAK 2017.

Baker, R.S. (2017) Data Science for Educational Research, Industry, and Policy. Invited Presentation at the 9th Data Science Showcase. New York, NY.

Baker, R. (2017) Towards Massive Replication using Data From Massive Online Open Courses. Presentation at the Subway Summit. New York, NY.

Baker, R.S. (2016) Participation in panel Running a Learning Analytics Centre: Stories & Conversations. At Australian Learning Analytics Summer Institute.

Baker, R.S. (2016) Participation in panel Deeper Dive into Assessment Strategies/Types and LA. At Understanding the Role of Learning Analytics in Technology-Enhanced Education. New York University. New York, NY.

Baker, R.S. (2016) Integrating Knowledge Engineering with Data Mining in Measuring Engagement. Invited talk at the 16th Annual Maryland Assessment Conference. College Park, MD.

Baker, R.S. (2016) Measuring Affect and Affect Dynamics in Simulations. Invited talk, Workshop on Machine Learning for Digital Education and Assessment Systems. International Conference on Machine Learning. New York, NY.

Baker, R.S. (2016) Participation in session Information Technologies to Advance Teaching and Learning, at Conversations with Innovators. Philadelphia, PA.

Baker, R.S. (2016) Modeling Complex Skill with Educational Data Mining. Invited talk, International Conference on e-Learning in the Workplace. New York, NY.

Baker, R.S. (2016) Participation in Panel “New Technologies and the Future of Learning Experiences”. International Conference on e-Learning in the Workplace. New York, NY.

Baker, R.S. (2016) Comments on the Symposium: “Exploring Timing and Process in Large-Scale Assessments”. 2016 Annual Meeting of the National Council on Measurement in Education.

Baker, R.S. (2016) Interaction logs: a powerful tool for studying engagement and learning in a very fine-grained fashion. Invited Presentation at International Perspectives on School Governance: A German-American Seminar. 2016 Annual Meeting of the American Educational Research Association. Washington, DC.

Wang, Y., Baker, R. (2015) Content or Platform? An Alternative Way to Understand MOOC Students. Presentation at Learning with MOOCS II. New York, NY.

Wang, Y., Baker, R., Alevan, V., Rose, C., Sewall, J., Popescu, O., Tomar, G., Feschke, O., Cennamo, M. (2015) Interactive Activities in MOOCs. Poster Presentation at Learning with MOOCS II. New York, NY.

Baker, R.S. (2015) Deep Dive: Models and Design. 12<sup>th</sup> Annual Online Learning Consortium Blended Learning Conference and Workshop 2015. Denver, CO.

Baker, R.S. (2015) Learning Analytics on a MOOC on Learning Analytics. Invited talk at the V. Jornadas eMadrid sobre “Educacion Digital”. Madrid, Spain.

San Pedro, M.O.Z., Baker, R.S., Bowers, A.J., Heffernan, N.T. (2015) Predicting College Enrollment from Machine-Learned Assessments of Knowledge, Academic Emotions and

Behavior Within an Educational Software. Poster presentation at the 9<sup>th</sup> Annual Machine Learning Symposium at the New York Academy of Sciences.

Baker, R.S. (2015) O papel de Big Data na transformação da avaliação e do currículo escolar: exemplos de sucesso. 4o seminário internacional: Centro Lemann para Empreendedorismo e Inovação na Educação Brasileira. Centro Lemann em Stanford University.

Baker, R.S. (2014) Panel presentation at Inaugural Meeting of the Global Learning Council. Pittsburgh, PA.

Baker, R.S. (2014) Panel presentation at 2<sup>nd</sup> Annual Executive STEM Summit: Science of Learning. New York, NY.

Wang, Y., Baker, R.S. (2014) MOOC Learner Motivation and Course Completion. Panel presentation at Learning with MOOCs: A Practitioner's Workshop. Cambridge, MA.

Baker, R.S. (2014) Participation in session Invention and Innovation: Revealing the Intangibles of Learning, at Conversations with Innovators. Philadelphia, PA.

Baker, R.S. (2014) Panel presentation at MocoShop 2014 (the 2nd Research-Oriented Workshop on Massive Open Online Courses), at International Conference of the Learning Sciences.

Baker, R.S., Ocumpaugh, J.L., San Pedro, M.O.C.Z., Gowda, S.M., Gowda, S.M. (2014) Studying Student Affect in Computer-Based Learning Environments with Field Observations and Log Files. Panel presentation at American Educational Research Association 2014.

Carvalho, A.M.J, Stahelin, N., Baker, R.S.J. (2014) An Integrative Program Modeling Authentic Field Science Experiences for Students. Presentation at the 43rd North American Association of Environmental Education.

Baker, R.S. (2014) Toward Demonstrating the Value of Learning Analytics for Education. Invited panel presentation at American Educational Research Association 2014.

Baker, R.S. (2014) Invited panel "What is the Future of Online Research Opportunities and the Practical Implications at Scale?". AERA Technology, Instruction, Cognition and Learning Special Interest Group, American Educational Research Association 2014.

Sao Pedro, M.A., Gobert, J.D., Baker, R. (2014) The Impacts of Automatic Scaffolding on Students' Acquisition of Data Collection Inquiry Skills. Roundtable presentation at American Educational Research Association 2014.

Baker, R.S. (2014) What You Can Do With the Data Exhaust. Invited panel presentation at the Online Learning Summit. University of California, Berkeley.

Baker, R.S. (2014) Big Data in Training and Education. Webinar panel for Harrisburg University.

Baker, R. (2013) Learning Analytics. Panel presentation at Ithaca Sustainable Scholarship 2013.

Baker, R.S.J.d. (2013) Towards Using Educational Data Mining to Improve the Assessment of Student Understanding of Ecology. Symposium Presentation at the Annual Meeting of the Ecological Society of America.

Baker, R.S.J.d. (2013) Culture and Technology. Panel presentation at the 16<sup>th</sup> International Conference on Artificial Intelligence and Education.

Baker, R.S.J.d. (2013) Building the Educational Data Scientist. Panel presentation at the 2013 Learning Analytics Summer Institute.

Koedinger, K.R., Baker, R.S.J.d. (2013) Data Mining and Intelligent Tutors. Invited presentation at the 2013 Learning Analytics Summer Institute.

Asbell-Clarke, J., Rowe, E., Sylvan, E., Baker, R.S.J.d. (2013) Working through Impulse: Assessment of Emergent Learning in a Physics Game. Symposium presentation at the 9<sup>th</sup> International Conference on Games, Learning, and Society.

Baker, R.S.J.d. (2013) Multi-Faceted Assessment During Online Learning. Invited Presentation at Distance Education & Online Learning in Physics Workshop of the American Physical Society.

Baker, R.S.J.d. (2013) Future Technologies, Today. Invited Presentation at Apps that Close the Gap Summit.

Baker, R.S.J.d. (2013) Educational Data Mining: Potentials and Possibilities. Symposium presentation at the 2013 Annual Meeting of the American Educational Research Association.

Roll, I., Baker, R. (2013) Using Learning Analytics to Inform Theories of Help-Seeking. Symposium presentation at the 2013 Annual Meeting of the American Educational Research Association.

Gobert, J., Sao Pedro, M., Raziuddin, J., Baker, R. (2013) Developing And Validating EDM-Based Assessment Measures For Measuring Science Inquiry Skill Acquisition And Transfer Across Science Topics. Symposium presentation at the 2013 Annual Meeting of the American Educational Research Association.

Wixon, M., Gobert, J., Baker, R.S.J.d., Bachmann, M. (2013) WTF (Without Thinking Fastidiously) as Predicted by Student Learner Characteristics. Symposium presentation at the 2013 Annual Meeting of the American Educational Research Association.

Baker, R.S.J.d. (2013) We Need More Education Data Scientists. Symposium presentation at the Third International Conference on Learning Analytics and Knowledge.

Baker, R.S.J.d. (2013) Educational Data Mining Essentials. Presentation at Sims and Games Learning Analytics and Educational Data Mining Workshop.

Baker, R.S.J.d. (2012) Show Me The Data: What Automated Detectors Can (and Can't) Do. Invited presentation at the Engagement and Academic Tenacity Convening. Cambridge, MA, USA.

Blikstein, P., Worsley, M., Sherin, B., Baker, R., Berland, M., Martin, T., Roll, I., Alevan, V., Koedinger, K., HersHKovitz, A. (2012) Building Bridges between Learning Analytics, Educational Data Mining, and Core Learning Sciences Perspectives. Symposium at the 10<sup>th</sup> International Conference of the Learning Sciences.

Baker, R.S.J.d. (2011) Tracking Student Engagement during Learning from Educational Software. Invited presentation at the Massachusetts STEM Summit.

Gobert, J.D., Baker, R.S.J.d., Sao Pedro, M. (2011) Using Machine-Learned Detectors to Assess and Predict Students' Inquiry Performance. Presentation at the 2011 Fall Meeting of the Society for Research on Educational Effectiveness.

Baker, R.S.J.d. (2011) Observational and Log Analysis Methods for Assessing Engagement and Affect in Educational Games. Presentation at Games for Learning Day at Games For Change 2011.

Hausmann, R.G.M., Youngblood, M., Lane, H.C., Baker, R.S.J.d. (2011) Game-Based Intelligent Tutoring Systems. Panel session at FLAIRS-24.

Castro, M.J., Cárdenas, E.S., Ogan, A., Baker, R.S.J.d. (2011) Tutor Cognitivo y el incremento de aprendizaje en matemática. (Cognitive Tutors and Learning Gains in Mathematics). *CIAEM 2011: XIII Conferencia Interamericana de Educación Matemática*.

Gobert, J.D., Montalvo, O., Toto, E., Sao Pedro, M., Baker, R.S.J.d. (2010) The Science Assistments Project: Scaffolding Scientific Inquiry Skills. Interactive Event at *10<sup>th</sup> International Conference on Intelligent Tutoring Systems*. **[People's Choice Award for Best Interactive Event]**

Goldstein, A.B., Baker, R.S.J.d., Heffernan, N.T. (2010) Pinpointing Learning Moments: A finer grain P(J) model. Poster abstract. *Proceedings of the 3<sup>rd</sup> International Conference on Educational Data Mining*, 289-290.

Baker, R.S.J.d., de Carvalho, A.M.J.B., Raspat, J., Alevan, V., Corbett, A.T., Koedinger, K.R. (2010) Using Taxonomies and Educational Data Mining to Understand How Educational Software Design Impacts Gaming the System. Presentation at Symposium at the 2010 Annual Meeting of the American Educational Research Association.

Lee, D.M.C., Ramos, C.C., Sy, C.W.C., Rodrigo, M.M.T., Baker, R.S.J.d. (2010) Detecting Boredom and Confusion among Novice Programmers using BlueJ Compile Logs. Poster at Philippine Computing Society Congress 2010.

Baker, R.S., Corbett, A.T., Alevan, V. (2009) Determining when an error is actually a slip. Presentation in Educational Data Mining: Seeing How Students Really Err. Symposium at the 13<sup>th</sup> Biennial Conference of the European Association for Research on Learning and Instruction.

Rodrigo, M.M.T., Baker, R.S.J.d., Abalos, N., Bacuyag, K., Basuel, B., Bautista, M., Cortez, M., Dulla, G., Elomina, S., Gineta, M.A., Rara, A., Rodriguez, R., Sanggalang, J., Sugay, J., Tan, A.K., Tan, M., Trajano, E., Uy, F., Victorino, N., Villaflor, K. (2009) A comparison of learners' affect and behaviors while using an intelligent tutor and an educational game. Presentation at Philippine Computing Society Congress 2009.

Rodrigo, M.M.T., Baker, R.S., Sugay, J.O., Tabano, E. (2009) Monitoring novice programmer affect and behaviors to identify learning bottlenecks. Presentation at Philippine Computing Society Congress 2009.

Baker, R.S.J.d., Koedinger, K.R. (2008) Educational Data Mining: Opportunities for the International Internet Classroom. Presentation at *AAAI Fall Symposium: Education Informatics: Steps Towards the International Internet Classroom*.

Baker, R.S.J.d, Alevan, V., Koedinger, K.R., Rodrigo, M., Heffernan, N.T., Corbett, A.T., Roll, I. (2008) Gaming the System: Evidence from Data Mining and Human Observation on Affect, Attitudes, and Learning. Presentation at *Technology, Instruction, Cognition, and Learning Symposium*.

Koedinger, K.R., Alevan, V., Baker, R.S.J.d., Roll, I. (2007) Toward Understanding When Tutoring Meta-Cognition Enhances Domain Learning. *Workshop on Metacognition and Self-Regulated Learning in Intelligent Tutoring Systems*, 1-2.

Baker, R.S. (2006) Educational Data Mining. Panel “Intelligent Tutoring Scales Up!” at *8<sup>th</sup> International Conference on Intelligent Tutoring Systems*.

Koedinger, K.R., Baker, R.S. (2006) Production Systems. *Presentation at the TICL Masters Conference*.

Baker, R.S., Beck, J.S. (2005) Psychometric Machine-Learned Models. *Presentation at the Educational Data Mining Workshop at the annual meeting of the American Association for Artificial Intelligence*.

Rosé, C.P., Anthony, L., Baker, R.S., Corbett, A.T., Pain, H., Porayska-Pomsta, K. (2004) Towards Encouraging a Learning Orientation Above a Performance Orientation. Panel at *7<sup>th</sup> International Conference on Intelligent Tutoring Systems*, 907.

Baker, R.S., Corbett, A.T., Koedinger, K.R. (2003) Statistical Techniques For Comparing ACT-R Models of Cognitive Performance. *Proceedings of the 10th Annual ACT-R Workshop*, 129-134.

Baker R.S., Corbett A.T., Koedinger K.R. (2002) Distinct Errors Arising From a Single Misconception. Published as abstract, *Proceedings of the Cognitive Science Society Conference*, 990.

Baker R., Parberry I. (1996) Increasing Frame Rate In An Interactive Sprite Engine. Published as abstract, *Texas Academy of Science Conference*.

### **Humor Articles**

Baker, R.S. (2002) The Sleep-Retardant Properties of My Ex-Girlfriend. *Annals of Improbable Research*, 8 (3), 9-11. Re-printed in *American Physical Society (APS) News*, February 2004, 13 (2)

Baker, R.S., Baker, R.S., Baker, R.S. (2002) Collaborative Research Across Alternate Universes. *Psychology Postgraduate Affairs Group Quarterly*.

### **Other Publications**

Baker, R.S. (2018) *Big Data and Education*. Online open textbook.

1<sup>st</sup> edition (2013); 2<sup>nd</sup> edition (2015); 3<sup>rd</sup> edition (2017); 4<sup>th</sup> edition (2018)  
<http://www.upenn.edu/learninganalytics/ryanbaker/bigdataeducation.html>

Baker, R.S. (2018) *Knowledge Inference and Structure Discovery for Education*. Self-paced MOOC.

Ocuppaugh, J., Baker, R.S., Rodrigo, M.M.T. (2015) *Baker Rodrigo Ocuppaugh Monitoring Protocol (BROMP) 2.0 Technical and Training Manual*. Technical Report. New York, NY: Teachers College, Columbia University. Manila, Philippines: Ateneo Laboratory for the Learning Sciences.

Ocuppaugh, J., Baker, R.S.J.d., Rodrigo, M.M.T. (2012) *Baker-Rodrigo Observation Method Protocol (BROMP) 1.0. Training Manual version 1.0*. Technical Report. New York, NY: EdLab. Manila, Philippines: Ateneo Laboratory for the Learning Sciences.

Baker, R.S.J.d. (2012). Guessing and Learning. In N.M. Seel (Ed.), *Encyclopedia of the Sciences of Learning* (pp. 1397-1398). Heidelberg, Germany: Springer-Verlag.

Baker, R.S.J.d. (2012). Guessing Model. In N.M. Seel (Ed.), *Encyclopedia of the Sciences of Learning* (pp. 1398-1399). Heidelberg, Germany: Springer-Verlag.

## PATENTS

Gobert, J., Baker, R. S., Sao Pedro, M. (awarded, June 21, 2016). Inquiry Skills Tutoring System. US Patent no. 9373082.

Gobert, J., Sao Pedro, M., Betts, C., & Baker, R.S. (awarded, February 7, 2017). Inquiry Skills Tutoring System (Child Patent for Alerting System). US Patent no. 9564057.

## GAMES

Baker, R.S., Baker, M.T. (2015) *Academic Squabble*.  
<http://www.columbia.edu/~rsb2162/AcademicSquabble/academic-squabble.html>

Baker, R.S., LaPointe, F. (1992) *Crunch!*

## INVITED SEMINARS/CONFERENCE PLENARY TALKS

Learning Analytics: Promises and Limitations. Center for Teaching Advancement and Assessment Research, Rutgers University. October 15, 2018.

Towards Understanding App Effectiveness and Cost. Making Data C.A.R.E: BrightBytes Big Data Summit 2018. Cedar Creek, TX. October 11, 2018.

The Dynamics of Affect in Online Learning. Office of Open Learning xTalk, fMassachusetts Institute of Technology. September 26, 2018.



Leveraging Educational Data Mining Techniques to Determine Factors Impacting Military-Connected Students. Distinguished Lecture (with Andrew Berning), 20<sup>th</sup> Annual National Training Seminar, Military Child Education Coalition. Washington, DC. July 24, 2018.

Studying Carelessness in Online Learning. American Institutes for Research. July 11, 2018.

Towards Massive Replication of Scientific Findings in Massive Online Open Courses. University of North Texas. February 1, 2018.

Data Mining in Education. TERC. January 29, 2018.

Towards Development of Better Real-Time Sensor-Free Detectors of Student Affect. Washington University in St. Louis. January 19, 2018.

Towards Massive Replication of Scientific Findings in Massive Online Open Courses. Massachusetts Institute of Technology, Teaching Systems Laboratory. December 1, 2017.

Long-Range Predictions of Student Success. LRNG Brown Bag Webinar. November 9, 2017.

Towards Massive Replication of Scientific Findings in Massive Online Open Courses. St. John's University. November 6, 2017.

Turning Big Data into Big Benefits for Students. Keynote address, Tech and Learning Leadership Event. Denver, CO. October 26, 2017.

Towards Massive Replication of Scientific Findings in Massive Online Open Courses. Cognitive Science Colloquium, Indiana University. October 16, 2017.

Modeling Complex Skill in Open-Ended Learning. Webinar, Hewlett Foundation Assessment Cluster. October 5, 2017.

Towards Massive Replication of Scientific Findings in Massive Online Open Courses. University of Oklahoma. September 13, 2017.

Towards Faster Development of Better Affect Detectors. Intel. August 14, 2017.

Integrating Knowledge Engineering with Data Mining in Measuring Engagement. ACT, Inc. July 11, 2017.

Modeling wheel-spinning and productive persistence in middle school mathematics. ACT, Inc. July 11, 2017.

Towards Massive Replication of Scientific Findings in Massive Online Open Courses. University of Illinois Urbana-Champaign, National Center for Supercomputer Applications. April 14, 2017.

Ryanalytics: Using data to improve my scientific productivity and life. PIER Brown Bag Series, Carnegie Mellon University. Feb 28, 2017.

Predicting Short-Term Success and Longer-Term Participation from MOOC Engagement. PIER Speaker Series, Carnegie Mellon University. Feb 27, 2017.

Predicting Short-Term and Long-Term Success from MOOC Engagement. University of Michigan. February 6, 2017.

Discussion Forum and Interaction Data for Predicting Success from MOOCs. Featured speaker, 4th International Conference on Writing Analytics. January 13, 2017.

Learning Analytics and Educational Data Mining: Opportunities for Industry. Keynote address, Industrial Meeting on Big Data in Education in China. Beijing, China (remote presentation). January 10, 2017.

Modeling Complex Skill with Educational Data Mining. IEEE Signal Processing Society, Princeton/central New Jersey section. December 15, 2016.

Engagement and Success in Online Learning: Tertiary Education and Beyond. Keynote talk at Australasian Society for Computers in Learning in Tertiary Education. November 28, 2016.

Massive Replication of Scientific Findings in Massive Online Open Courses. Keynote talk at Australian Learning Analytics Summer Institute. November 27, 2016.

Modeling Complex Skill with Educational Data Mining. Center for Research on Learning and Instruction. University of Sydney. November 25, 2016.

Ethical Applications of Learning Analytics in a Complex and Changing World. Connected Intelligence Center, University of Technology Sydney. November 24, 2016.

Learning Analytics in a Complex and Changing World. Teachers College, Columbia University. October 31, 2016.

Engagement and Success in Online Learning: Higher Education and Life-Long Learning. Rutgers University. October 19, 2016.

Engagement and Success in MOOCs. University of Oklahoma. August 1, 2016.

Engagement and Success in Online Learning: Higher Education and Beyond. LINK Research Lab, University of Texas Arlington. July 29, 2016.

Welcome. NY LASI (Learning Analytics Summer Institute) Local 2016. New York, NY. June 27, 2016.

Data Mining in Education. Data Science in Education Meetup. Boston, MA. June 20, 2016.

Learning Analytics – Key Considerations. Invited talk at Quality Assurance Agency Scottish Higher Education Enhancement Committee Learning Analytics Briefing. Edinburgh, Scotland. May 2, 2016.

Long-Term and Actionable Prediction of Student Outcomes Using Automated Detectors of Engagement and Affect. Moray House School of Education, University of Edinburgh. May 2, 2016.

Using Learning Analytics to Study Engagement and Success in Higher Education. Faculty of Science and Engineering, University of Wolverhampton. April 26, 2016.

How We Learn. Future of Learning Forum, Columbia Business School, Columbia University. March 4, 2016.

Engagement and Success in Online Learning: Higher Education and Beyond. Center for Teaching and Learning. St. John's University. February 16, 2016.

Long-Term and Actionable Prediction of Student Outcomes Using Models that Infer Engagement and Affect Automatically From Online Learning Logs. Data Science Talk Series. Rutgers University Newark. February 5, 2016.

Learning Analytics and Educational Data Mining: Opportunities for K12. K12. November 18, 2015.

Long-Term and Actionable Prediction of Student Outcomes Using Automated Detectors of Engagement and Affect. City University of New York, Graduate Center. November 5, 2015.

Research in the MOOC Big Data in Education. Plenary address at the Third Meeting of Computational Behavioral Sciences. Wuhan, China. October 12, 2015.

The Emergence of Big Data in Education. School of Psychology, Central China Normal University. October 11, 2015.

Towards Long-Term and Actionable Prediction of Student Outcomes using Automated Detectors of Engagement and Affect. Department of Educational Psychology (Quantitative Methodology), University of Georgia. September 18, 2015.

Detecting Engagement Automatically with a Combination of Data Mining and Knowledge Engineering. CRESST Conference 2015. August 20, 2015.

Educational Data Mining: Opportunities and Potential. University of Oklahoma. August 6, 2015.

Predicting Learner Outcomes with Learning Analytics. Blackboard DevCon 2015. July 20, 2015.

Predictive Analytics for Education. Presentation to the Educational Data Mining/Learning Analytics Meetup, New York, NY. July 14, 2015.

Intelligent Tutoring Systems and MOOCs. Keynote presentation at the 2<sup>nd</sup> Symposium of Learning Science and Online Education (with Xiangen Hu). July 9, 2015.

Educational Data Mining: Potentials for MOOCs and Blended Learning in Higher Education. Plenary Address at the 12<sup>th</sup> Annual Online Learning Consortium Blended Learning Conference and Workshop 2015. July 8, 2015.

Personal Knowledge/Learning Graph. Keynote presentation at the 8<sup>th</sup> International Conference on Educational Data Mining (with George Siemens and Dragan Gasevic). June 26, 2015.

Learning Analytics: What the Research Says. London Knowledge Lab. May 28, 2015.

Educational Data Mining: Potential for Online Training. National Center for Disaster Preparedness. April 23, 2015.

Predictive Analytics for Education. Presentation to the Educational Data Mining/Learning Analytics Meetup, Boston MA. April 8, 2015.

Engagement in Reasoning Mind Classrooms. Keynote presentation at GENIECON. February 28, 2015.

Towards Long-Term and Actionable Prediction of Student Outcomes using Automated Detectors of Engagement and Affect. Institute for Quantitative Theory and Methods, Emory University. February 9, 2015.

Towards Measuring Engagement and Affect in Online Learning. EdX. February 5, 2015.

Towards Long-Term and Actionable Prediction of Student Outcomes using Automated Detectors of Engagement and Affect. Frontier Lecture Series. Department of Teaching, Learning, and Culture. Texas A&M University. December 4, 2014.

Educational Data Mining: A Revolution in Methods for Understanding Learners and Learning. Faculty of Mathematics, Moscow State Pedagogical University. November 21, 2014.

Educational Data Mining: A New Generation of Methods for Understanding Learners and Learning. Faculty of Business Informatics, National Research University: Higher School of Economics. November 18, 2014.

Educational Data Mining: Potential for Medical Education. New York University School of Medicine. November 12, 2014.

Long-Term Predictions of Student Outcomes From Engagement in Online Learning. Institute of Education, Tsinghua University. October 23, 2014.

Studying Moment-by-Moment Learning. School of Psychology. Central China Normal University. October 21, 2014.

Towards Detecting Student Inquiry Skill in Microworlds and Virtual Environments. School of Psychology. Central China Normal University. October 20, 2014.

Big Data Mining in the Field of Education. Conference on Computational Behavioral Sciences & The 2<sup>nd</sup> Symposium on Internet Research and Social Alarm. October 18, 2014.

Student Engagement in Digital Learning. Public webinar in coordination with Reasoning Mind. October 7, 2014.

Analitica de Aprendizaje. 11o Congreso Internacional y 8o Nacional de Informatica y Sistemas. October 3, 2014.

Towards Better and More General Prediction Models of Engagement. LINK Lab, University of Texas, Arlington. September 29, 2014.

Big Data in Education Research. Institute of Education Sciences Principal Investigator Meeting. September 3, 2014.

Educational Data Mining: A Revolution in Methods for Understanding Learners and Learning. Department of Computer Science and Automation. Indian Institute of Science. July 18, 2014.

Advancing the Science of Learning with Educational Data Mining. Public lecture. Coimbatore, India. July 16, 2014.

Predicting Longer-Term Outcomes From Automated Measures of Engagement and Affect. NorthEast Regional Computing Program Workshop on Analytics in Higher Education. June 16, 2014.

Towards Long-Term and Actionable Prediction of Student Outcomes using Automated Detectors of Engagement and Affect. School of Education and Social Policy. Northwestern University. May 1, 2014.

Measuring Learner Engagement with Data Mining. National Conference on Measurement in Education. April 4, 2014.

Studying the Antecedents of Eureka Moments During Learning. Institute for Intelligent Systems. University of Memphis. March 18, 2014.

Towards Long-Term and Actionable Prediction of Student Outcomes using Automated Detectors of Affect and Engagement. Graduate School of Education. Harvard University. March 11, 2014.

Advancing the Science of Learning with Educational Data Mining. Indian Institute of Technology Madras Research Park. February 14, 2014.

Learning Analytics: Potential and Principles. Association for Educational Communications and Technology (AECT) RTD Webinar Series. February 6, 2014.

Towards Long-Term and Actionable Prediction of Student Outcomes using Automated Detectors of Engagement and Learning. Learning Sciences Institute, Arizona State University. November 22, 2013.

Using Educational Data Mining to Study Problem Behaviors in Online Learning. Association for Behavior Analysis International (ABAI), Second Education Conference. Chicago, IL. November 9, 2013.

Adaptive Learning. Cambridge University Press. October 8, 2013.

Educational Data Mining. Pearson, Inc. August 21, 2013.

Predicting Preparation for Future Learning Better Using Quantitative Analysis of Moment-by-Moment Learning. ETS. July 24, 2013.

EDM in a Complex and Changing World. Keynote Address. 6<sup>th</sup> International Conference on Educational Data Mining. Memphis, Tennessee. July 9, 2013.

Envisioning the Future of Cyberlearning. Keynote address. Cyberlearning: Synthesis and Envisioning 2013. Arlington, Virginia. June 26, 2013.

Affect, Collaboration, and Off-Task Behavior in the Chemistry Virtual Lab. Minerva University. April 30, 2013.

Educational Data Mining: Towards Long-Term and Actionable Prediction of Student Outcomes. College of Education and Human Development. University of Wisconsin. April 19, 2013.

Towards Detecting Student Inquiry Skills in Microworlds and Virtual Environments. Educational Measurement and Applied Cognitive Sciences Research Unit. University of Luxembourg. April 9, 2013.

Modeling Student Learning, Moment-by-Moment. Center for Research and Evaluation of Advanced Technologies in Education. New York University. March 1, 2013.

Educational Data Mining: Predict the Future, Change the Future. Data Mining Possibilities Seminar Series. City University of New York Graduate Center. February 15, 2013.

Modeling Student Learning, Moment by Moment. Reasoning Mind. February 7, 2013.

Towards Detecting Student Inquiry Skills in Science Microworlds. New York Hall of Science, December 21, 2012.

Educational Data Mining: A Revolution in Methods for Understanding Learners and Learning. Electrical Engineering and Computer Science Department. University of Toledo. December 3, 2012.

Educational Data Mining: Predict the Future, Change the Future. Julius and Rosa Sachs Distinguished Lecture. Teachers College, Columbia University. November 5, 2012.

Studying Student Disengagement with Educational Data Mining. Institute of Cognitive Science, University of Colorado, Boulder. October 26, 2012.

Modeling Student Learning, Moment-by-Moment. Department of Computer Science, University of Colorado, Boulder. October 25, 2012.

Using Educational Data Mining to Detect Disengagement. Reasoning Mind. October 23, 2012.

Towards Automatically Detecting the Robustness of Student Learning. Computer Science and Artificial Intelligence Laboratory, Massachusetts Institute of Technology. August 31, 2012.

Modeling the Learning in 4-D. Keynote Address. 20<sup>th</sup> International Conference on User Modeling, Adaptation, and Personalization. July 18, 2012.

Educational Data Mining Methods for Modeling and Studying Gaming the System in Educational Software. ETS. April 24, 2012.

Studying Student Disengagement and the Robustness of Learning with Educational Data Mining. BBN Technologies, Cambridge, Massachusetts. February 3, 2012.

Towards Automatically Detecting the Robustness of Student Learning. AAALab/LIFE Center, School of Education, Stanford University, September 30, 2011.

Towards Automatically Detecting the Robustness of Student Learning. Pittsburgh Science of Learning Center Colloquium, Carnegie Mellon University, May 23, 2011.

Towards Automatically Detecting the Robustness of Student Learning. Invited Talk, Intelligent Tutoring Systems Track. 24<sup>th</sup> Florida Artificial Intelligence Research Society Conference. Palm Beach, Florida. May 19, 2011.

Using Educational Data Mining to Detect Disengagement and the Moment of Student Learning. Teachers College, Columbia University. March 23, 2011

Using Educational Data Mining to Detect the Moment of Student Learning. 11<sup>th</sup> Philippine Computing Science Congress (PCSC2011). Naga, Bicol, Philippines. March 4, 2011.

Using Educational Data Mining to Detect the Moment of Student Learning. Department of Computer Science, University of the Philippines Diliman. February 28, 2011.

Educational Data Mining: A Revolution in Methods for Understanding Learners and Learning. University of Veracruz, Mexico (by videoconference). May 28, 2010.

Intelligent Tutoring Goes to School in the Big City... and the Suburbs... and the Countryside... and right here in Metro Manila! College of Computer Studies, De La Salle University – Manila, Philippines. April 8, 2010.

Intelligent Tutoring Goes to School in the Big City... and the Suburbs... and the Countryside... and the Developing World Mega-City. Department of Computer Science, University of Massachusetts Amherst. February 25, 2010.

Educational Data Mining: A Revolution in Methods for Understanding Learners and Learning. Science Colloquium Series, Colgate University. November 20, 2009.

Interface design, affect, and students' choice to "game the system". BostonCHI: The New England area chapter of ACM SIGCHI. September 8, 2009.

Towards Understanding Why Students "Game the System" Within Educational Software. Institute for Intelligent Systems, University of Memphis. March 12, 2009.

Towards Understanding Why Students Game the System. Department of Educational and Counseling Psychology, McGill University. June 18, 2008.

Using Data Mining to Better Understand Learning and Learners: Key Challenges and Directions. Department of Computer Science, University of Sherbrooke. June 17, 2008.

Detecting and Responding to Gaming the System in Cognitive Tutors. Carnegie Learning, Inc. April 3, 2008.

Towards Educational Software that Detects and Responds to All the Ways Students Choose to Use It. Department of Computer Science, Worcester Polytechnic Institute. September 14, 2007.

Detecting and Understanding Gaming the System and Off-Task Behavior in Intelligent Tutoring Systems. London Knowledge Lab, University of London. April 26, 2007.

Developing Systems that Detect and Adapt to When Students Game the System. Human-Centered Technology Group, School of Informatics, University of Sussex. November 2, 2006.

Developing Systems that Detect and Adapt to When Students Game the System. School of Informatics, University of Edinburgh. October 27, 2006.

Scooter: an Agent Who Adapts to When Students Game the System. Mixed Reality Laboratory, School of Computer Science, University of Nottingham. October 20, 2006.

Gaming the System: How it Affects Learning and Why Students Do It. Pädagogische Psychologie Group, Department of Psychology, University of Muenster. July 14, 2005.

Remediating Resilient Overgeneralization in Data Representation. Pittsburgh Supergroup for Scientific Reasoning, University of Pittsburgh. October 10, 2003.

A model of resilient overgeneralization: When you know bar graphs, all data looks categorical. UIC Cognitive Brown Bag Lecture, University of Illinois at Chicago. November 20, 2001.

## ADVISING

**Doctoral Advisor.** Shamyia Karumbaiah. Ph.D. student in Teaching, Learning, and Leadership at the University of Pennsylvania. (in process)

**Doctoral Advisor.** Miguel Andres. Ph.D. student in Teaching, Learning, and Leadership at the University of Pennsylvania. (in process)

**Doctoral Advisor.** Stefan Slater. Ph.D. student in Teaching, Learning, and Leadership at the University of Pennsylvania. (in process)

**Doctoral Advisor.** Michael Aaron Hawn. Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. (in process)

**Doctoral Advisor.** Richard Scruggs. Ph.D. student in Higher Education at University of Pennsylvania (in process).

**Doctoral Advisor.** Shimin Kai. Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. (in process)

**Doctoral Advisor.** Chad Coleman. Ph.D. student in Cognitive Studies in Education, Teachers College Columbia University. (in process)

**Doctoral Advisor.** Jeffrey Bender (co-advisor: Gail Kaiser). Doctoral student in Computer Science at Columbia University. (in process)

**Doctoral Advisor.** Steve Gomez. Doctoral student in PennCLO at University of Pennsylvania. (in process)

**Doctoral Advisor.** Victoria "Mia" Almeda. Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2018. Research Scientist at TERC as of 2018.



**Doctoral Advisor.** Yang Jiang (co-advisor: John Black). Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2018. Research Scientist at ETS as of 2018.

**Doctoral Advisor.** Vasiliki Georgoulas. Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2018.

**Doctoral Advisor.** Elle Wang (co-advisor: John Black). Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2017. Research Scientist at Arizona State University as of 2018.

**Doctoral Advisor.** Jeanine DeFalco. Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2016. Research Scientist at Army Research Laboratory as of 2018.

**Doctoral Advisor.** Maria “Sweet” San Pedro. Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2016. Research Scientist at ACT as of 2018.

**Honorary Doctoral Thesis Co-Chair.** David Nadler Prata (Primary Chair: Evandro Barros Costa). Computer Science Department, Universidade Federal de Campina Grande, Campina Grande, Brazil. Graduated 2008.

**Post-Doctoral Mentor.** Luc Paquette. Post-doctoral research associate in Human Development at Teachers College Columbia University (2013-2015). Assistant Professor at University of Illinois, Urbana-Champaign as of 2018.

**Post-Doctoral Mentor.** Jaclyn Ocumpaugh. Post-doctoral fellow in Learning Sciences at Worcester Polytechnic Institute (2012-2013). Post-doctoral research associate in Human Development at Teachers College Columbia University (2013-2016). Senior Research Investigator at Penn Center for Learning Analytics, University of Pennsylvania (2016-present).

**Post-Doctoral Mentor.** Arnon HersHKovitz. Post-doctoral fellow in Learning Science at Worcester Polytechnic Institute (2011-2012; co-advisor: Janice Gobert). Post-doctoral research associate in Human Development at Teachers College Columbia University (2012-2013). Senior Lecturer at Tel Aviv University as of 2014.

**Masters Advisor.** Alexandra Andres. M.S. student in Learning Sciences and Technologies. (in process)

**Masters Advisor.** Stefan Slater. M.S. student in Learning Analytics. Graduated 2017.

**Masters Advisor.** Jing Zhang. M.A. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2016.

**Masters Advisor.** Yunjia Yao. M.S. student in Learning Analytics at Teachers College Columbia University. Graduated 2016.

**Masters Advisor.** Connie Liu. M.S. student in Learning Analytics at Teachers College Columbia University. Graduated 2016.

**Masters Advisor.** Supreeth Gowda. (co-advisor: Neil Heffernan). M.S. student in Learning Sciences and Technologies at Worcester Polytechnic Institute. Graduated 2014.

**Masters Advisor.** William Hawkins. (co-advisor: Neil Heffernan). M.S. student in Computer Science at Worcester Polytechnic Institute. Graduated 2014.

**Masters Advisor.** Michael Wixon. (co-advisor: Janice Gobert). M.S. student in Learning Science at Worcester Polytechnic Institute. Graduated 2013.

**Masters Advisor.** Adam Goldstein. (co-advisor: Neil Heffernan). M.S. student in Computer Science at Worcester Polytechnic Institute. Graduated 2011.

**Masters Research Supervisor.** Shiyue Zheng. M.S. student in Learning Analytics. Graduated 2017.

**Masters Research Supervisor.** Yijun Ma. M.S. student in Communication, Computing, & Technology in Education at Teachers College Columbia University. Graduated 2016.

**Masters Research Supervisor.** Victoria “Mia” Almeda. M.S. student in Neuroscience and Education. (2012- 2013)

**Doctoral Thesis Committee Member.** Zhitong Yang (thesis advisor: Susan Yoon). Ph.D. student in Teaching, Learning, and Teacher Education, University of Pennsylvania. (in process)

**Doctoral Thesis Committee Member.** Fatemeh Salehian Kia (thesis advisors: Marek Hatala and Lyn Bartram). Ph.D. student in School of Interactive Art and Technology, Simon Fraser University. (in process)

**Doctoral Thesis Committee Member.** Tanesia Beverly (thesis advisor: Betsy McCoach). Ph.D. student in Research Methodology, Evaluation, and Assessment, University of Connecticut. (in process)

**Doctoral Thesis Committee Member.** Kevin Ambrose (thesis advisor: Bruce Homer). Ph.D. student in Learning, Development, and Instruction, at the City University of New York Graduate Center. (in process)

**Doctoral Thesis Committee Member.** Kim Kelly (thesis advisor: Neil Heffernan). Ph.D. student in Learning Sciences and Technologies at Worcester Polytechnic Institute. Graduated 2018.

**Doctoral Thesis Committee Member.** Toi Sin Arvidsson (thesis advisor: Deanna Kuhn). Ph.D. student in Cognitive Studies at Teachers College Columbia University. Graduated 2018.

**Doctoral Thesis Committee Member.** Korinn Ostrow (thesis advisor: Neil Heffernan). Ph.D. student in Learning Sciences and Technologies, Worcester Polytechnic Institute. Graduated 2018.

**Doctoral Thesis Committee Member.** Seth Adjei (thesis advisor: Neil Heffernan). Ph.D. student in Computer Science at Worcester Polytechnic Institute. Graduated 2018.

**Doctoral Thesis Committee Member.** Alison Lee (thesis advisor: John Black). Ph.D. student in Cognitive Studies at Teachers College Columbia University. Graduated 2018.

**Doctoral Thesis Committee Member.** Douglas DiStefano (thesis advisor: Molly Ness). Ph.D. student at Fordham University. Graduated 2018.

**Doctoral Thesis Committee Member.** David Nitkin (thesis advisor: Douglas Ready). Ph.D. student in Educational Leadership at Teachers College Columbia University. Graduated 2018.

**Doctoral Thesis Committee Member.** Tiantian Jin (thesis advisor: John Black). Ph.D. student in Cognitive Studies at Teachers College Columbia University. Graduated 2018.

**Doctoral Thesis Committee Member.** Raha Moussavi (thesis advisor: Janice Gobert). Ph.D. student in Learning Sciences and Technologies at Worcester Polytechnic Institute. Graduated 2018.

**Doctoral Thesis Committee Member.** Naomi Wixon (thesis advisor: Ivon Arroyo). Ph.D. student in Learning Sciences and Technologies at Worcester Polytechnic Institute. Graduated 2018.

**Doctoral Thesis Committee Member.** Michelle Banawan (thesis chair: Mercedes Rodrigo) Ph.D. student in Computer Science at Ateneo de Manila University. Graduated 2017.

**Doctoral Thesis Committee Member.** Alison Lee (thesis advisor: John Black). Ph.D. student in Department of Human Development, Teachers College Columbia University. Graduated 2017.

**Doctoral Thesis Committee Member.** Ama Awotwi (thesis advisor: Herb Ginsburg). Ph.D. student in Cognitive Studies at Teachers College Columbia University. Graduated 2017.

**Doctoral Thesis Committee Member.** Joanne Duncan-Carnesciali (thesis advisor: Robert Fullilove). Ph.D. student in Health Education at Teachers College Columbia University. Graduated 2016.

**Doctoral Thesis Committee Member.** Michael Swart (thesis advisor: John Black). Ph.D. student in Cognitive Studies at Teachers College Columbia University. Graduated 2016.

**Doctoral Thesis Committee Member.** Kelly Feeney (thesis advisor: O. Roger Anderson). Ph.D. student in Science Education at Teachers College Columbia University. Graduated 2016.

**Doctoral Thesis Committee Member.** Nicole DiCrecchio (thesis advisor: James Corter). Ph.D. student in Measurement and Evaluation at Teachers College Columbia University. Graduated 2016.

**Doctoral Thesis Committee Member.** Diego Luna-Bazaluda (thesis advisor: Larry DeCarlo). Ph.D. student in Measurement, Evaluation, and Statistics, at Teachers College Columbia University. Graduated 2015.

**Doctoral Thesis Committee Member.** Yung-Yi Juliet Chao (thesis advisor: Barbara Tversky). Ph.D. student in Cognitive Studies at Teachers College Columbia University. Graduated 2015.

**Doctoral Thesis Committee Member.** Jung Yeon Park (thesis advisor: Matthew Johnson). Ph.D. student in Measurement, Evaluation, and Statistics, at Teachers College Columbia University. Graduated 2015.

**Doctoral Thesis Committee Member.** YuTao Wang (thesis advisor: Neil Heffernan). Ph.D. student in Computer Science at Worcester Polytechnic Institute. Graduated 2015.

**Doctoral Thesis Committee Member.** Karrie Godwin (thesis advisor: Anna Fisher). Ph.D. student in Psychology at Carnegie Mellon University. Graduated 2015.

**Doctoral Thesis Committee Member.** Ani Aghababayan (thesis advisor: Taylor Martin). Ph.D. student in Instructional Systems and Learning Sciences at Utah State University. Graduated 2014.

**Doctoral Thesis Reader.** Charles Lang (thesis advisor: Howard Gardener). Ph.D. student in Human Development and Education at Harvard University. Graduated 2014.

**Doctoral Thesis Committee Member.** Samantha Creighan (thesis advisor: Herbert Ginsburg). Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2014.

**Doctoral Thesis Committee Member.** Elizabeth Owen (thesis advisor: Constance Steinkuehler). Ph.D. student in Games, Learning, and Society at University of Wisconsin, Madison. Graduated 2014.

**Doctoral Thesis Committee Member.** Michael Sao Pedro (thesis advisor: Janice Gobert). Ph.D. student in Learning Sciences and Technologies at Worcester Polytechnic Institute. Graduated 2013.

**Doctoral Thesis Committee Chair (Honorary).** Dan Hoffman (thesis advisor: Chuck Kinzer). Ph.D. student in Communication, Computing, & Technology in Education. at Teachers College Columbia University. Graduated 2013.

**Doctoral Thesis Committee Member.** Kara Carpenter (thesis advisor: Herbert Ginsburg). Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2013.

**Doctoral Thesis Committee Member.** Zachary Pardos (thesis advisor: Neil Heffernan). Ph.D. student in Computer Science at Worcester Polytechnic Institute. Graduated 2012. Assistant Professor at the University of California, Berkeley as of 2013.

**Doctoral Thesis Committee Member.** Wendy Moore (thesis advisor: Deanna Kuhn). Ph.D. student in Cognitive Studies in Education at Teachers College Columbia University. Graduated 2012.

**Masters Thesis Committee Member.** Marcelo Almeida Santana (thesis chair: Evandros Barros Costa) M.S. student in Computer Science at the Universidade Federal de Alagoas. Graduated 2015.

**Masters Thesis Committee Member.** Juan Miguel Limjap Andres (thesis chair: Mercedes Rodrigo) M.S. student in Computer Science at Ateneo de Manila University. Graduated 2014.

**Masters Thesis Committee Member.** Jose Carlos Soriano (thesis chair: Mercedes Rodrigo) M.S. student in Computer Science at Ateneo de Manila University. Graduated 2012.

**Masters Thesis Committee Member.** Diane Lee (thesis chair: Mercedes Rodrigo) M.S. student in Computer Science at Ateneo de Manila University. Graduated 2011.

**Masters Thesis Committee Member.** Maria O.C.Z. San Pedro (thesis chair: Mercedes Rodrigo) M.S. student in Computer Science at Ateneo de Manila University. Graduated 2010.

**Masters Thesis Committee Member.** Karina Hizon (thesis chair: Mercedes Rodrigo) M.S. student in Computer Science at Ateneo de Manila University. Graduated 2009.

**International Doctoral Dissertation Reviewer.** Sergio Salmeron. (thesis chairs: Olga Santos and Jesus Boticario). Ph.D. student in Artificial Intelligence at Universidad Nacional de Educación a Distancia (UNED). Graduated 2017.

**Undergraduate Major Qualifying Project (WPI).** Kristin Hughes (2010)

**Undergraduate Interactive Qualifying Project (WPI).** Zhongxiu Liu & Visit Patara (2012-2013), Alan Alezker (2012-2013), Anthony Rojas & Daniel Roberge (2011), Gregory Moore (2011), Breanna McElroy & Mohammad Alshuqaiq (2011), Ryan Genato & Samantha Fontaine & Ricardo Belmontez (2011), Ethan Wolfe & James Salvati (2010-2011), Sean Burke & Michael Ducey & Sindi Silaj (2010)

**Independent Study Projects (WPI).** Michael Tidd (2011), Adam Nakama (2010), Dovan Rai (2010)

**Undergraduate Research Assistantships, Summer Internships, Summer Research Fellowships (WPI, 2009-2013):** Kevin Ramirez, Gregory Moore, Ravi Raval, Milan Desai, Robert Le, Meng Sun, Andrew Tremblay

**Undergraduate Research Assistantships, Summer Internships, Summer Research Fellowships (CMU, 2006-2008):** Owen Durni, Matthew Morrill, Brian Thompson

**External Examiner.** Jan Papousek (Ph.D. student in Computer Science at Masaryk University), in process. Ilkka Jormanainen (Ph.D. student in Computer Science at University of Eastern Finland), 2013. Luc Paquette (Ph.D. student in Computer Science at Sherbrooke University), 2013. Elys Vasquez-Iscan (Ph.D. student at Teachers College), 2013. Benjapol Benjapalakorn (Ph.D. student at Teachers College), 2013. Lichao Li (M.S. student in Information Technologies at University of Sydney). 2007.

## OTHER TEACHING EXPERIENCE

**Tutorial.** Baker, R.S. (2018) Feature Engineering. Bi-Annual Meeting of the Big Data for Education Spoke of the Northeast Big Data Hub. October 18, 2018.

**Tutorial.** Baker, R.S. (2018) Feature Engineering. Learning Analytics Summer Institute. June 11, 2018.

**Tutorial.** Baker, R.S. (2018) Feature Engineering. Teaching Systems Laboratory, Massachusetts Institute of Technology. May 18, 2018.

**Tutorial.** Baker, R.S., Nurnberger, A. (2018) Educational Data Mining Methods. Bi-Annual Meeting of the Big Data for Education Spoke of the Northeast Big Data Hub. February 16, 2018.

**Tutorial.** Baker, R.S. (2017) Educational Data Mining/Learning Analytics. National Center for Education Statistics. October 3, 2017.

**Tutorial.** Baker, R.S., Arroyo, I. (2017) Educational Data Mining. Annual Meeting of the Northeast Big Data Hub, Big Data for Education Spoke. August 28, 2017.

**Tutorial.** Baker, R.S. (2017) Data Mining and Big Data. French-American Chamber of Commerce. May 13, 2017.

**Webinar.** Siemens, G., Baker, R.S.J.d. (2013) State of the Field: Learning Analytics and Educational Data Mining. EDUCAUSE Learning Initiative. August 5, 2013.

**Workshop.** DiCerbo, K., Baker, R.S.J.d. (2013) Serious Gaming Analytics. Workshop presentation at the 2013 Learning Analytics Summer Institute. Stanford, California.

**Tutorial.** Costa, E.G., Baker, R.S.J.d., Amorim, L., Magalhaes, J., Marinho, T. (2012) Mineração de Dados Educacionais: Conceitos, Técnicas, Ferramentas e Aplicações. Jornada de Atualização de Informática em Educação 2012. Rio de Janeiro, Brazil.

**Instructor.** Pittsburgh Science of Learning Center Summer School. Summer 2012.

**Tutorial.** Nixon, T., Baker, R.S.J.d., Yudelson, M. & Pardos, Z. (2012). Parameter fitting for learner models. Workshop at the International Conference on Intelligent Tutoring Systems. Corfu, Greece.

**Tutorial.** Graesser, A., Baker, R.S.J.d., Beck, J.E. (2011) A Workshop on Adaptive Learning Systems: A Pre-Conference Workshop of the Philippine Computing Science Congress 2011. Naga, Bicol, Philippines.

**Tutorial.** Baker, R.S.J.d., Rodrigo, M.M.T. (2010) Toward the adaptive classroom: Emerging educational data mining methods for scientific discovery in education. Workshop in Philippines for Engineering Research and Development for Technology Consortium. Held at Ateneo de Manila University.

**Instructor.** Pittsburgh Science of Learning Center Summer School. Head, Educational Data Mining track. Summer 2010.

**Tutorial.** Baker, R.S.J.d., Yacef, K., Beck, J.E., Koedinger, K.R. (2009) Educational Data Mining. Tutorial at Artificial Intelligence in Education 2009.

**Instructor.** Pittsburgh Science of Learning Center Summer School. Co-head, Educational Data Mining track (with Kenneth R. Koedinger). Summer 2009.

**Instructor.** Pittsburgh Science of Learning Center Summer School. Co-head, Data Mining with DataShop track (with Kenneth R. Koedinger). Summer 2008.

**Teaching Assistant.** Cognitive Modeling and Intelligent Tutoring Systems, Professor Kenneth R. Koedinger. Human-Computer Interaction Institute, Carnegie Mellon University. Spring 2001.

**Teaching Assistant.** Advanced Algorithms, Professor Franco Preparata. Department of Computer Science, Brown University. Fall 1999.

**Head Teaching Assistant.** Data Structures and Algorithms, Professor Roberto Tamassia. Department of Computer Science, Brown University. Spring 1999.

**Teaching Assistant.** Data Structures and Algorithms, Professor Roberto Tamassia. Department of Computer Science, Brown University. Spring 1998.

**Teaching Assistant.** Intensive Algebra II Course. Intensive Mathematics Institute, Denton, TX. Summer 1996.

## ADVISORY BOARDS

McGraw-Hill Education Learning Sciences Research Council Advisory Board/ Learning Sciences Research Advisory Board. 2017-2018.

Army Research Laboratory. UM-ARL Advisory Board. 2018, 2016.

Central China Normal University. Academic Advisory Committee, School of Psychology and Key-lab and center. 2015.

Classba. Advisory Board. 2015-2016.

University of California, Irvine. Investigating Virtual Learning Environments. Advisory Board Member. For M. Warschauer (PI), 2015-2020.

University of Nevada, Las Vegas. Learning Theory and Analytics as Guides to Improve Undergraduate STEM Education, Advisory Board Member. For M. Bernacki (Project Lead). 2015-2018.

McGraw-Hill Education, 2015-2016.

Purdue University. Assessing and Improving Online Learning Spaces for At-Risk Engineering Students. Advisory Board Member. For J. DeBoer (Project Lead). 2015-2018.

NAEP Survey Assessment Innovations Laboratory Network. Advisory Board Member, 2014.

GameDesk, Inc. EXP: Learning Lens: An Evidence-Centered Tool for 21<sup>st</sup> Century Assessment. Advisory Board Member. 2013-2015.

Everest Edusys/QED, Centre for the Science of Learning (CSL). Scientific Learning Advisor. 2013-2014.

Concord Consortium. Collaborative Research: Large-Scale Research on Engineering Design Based on Big Learner Data Logged by a CAD Tool. Advisory Board Member. 2013-2015.

SRI, International. BCC-EHR: Developing Community Capacity to Measure Noncognitive Factors in Digital Learning Environments. Steering Committee Member. 2013-2015.

Teachley. Board of Advisors. 2013-2014.

Massachusetts Institute of Technology. Dynamic Formative Assessment Models Project Advisory Board. 2012-2013.

Army Research Laboratory. ARL-IIS Advisory Board. 2012-2013.

Stanford University. Learning Analytics Project Affinity Group. 2012-2013.

SRI International. Educational Data Mining Technical Working Group, led by Marie Bienkowski, 2011.

University of Colorado, Boulder. NSF Inquiry Hub project, led by Tamara Sumner, William Penuel. 2011-2014.

Carnegie Learning, Inc. Math360/Math Series Advisory Board. 2009-2011.

## **ACADEMIC SERVICE AT DEPARTMENT AND UNIVERSITY LEVEL**

**Committee on Degrees.** University of Pennsylvania Graduate School of Education. 2018-2019.

**Senate Committee on Faculty and the Administration (SCOA).** University of Pennsylvania. 2018-2019.

**Advisory Board.** Penn GSE Center for Innovation/Catalyst. 2017-present.

**Steering Committee.** PennCLO Executive Doctoral Program. 2017-present.

**Faculty Advisory Committee,** Online Learning Initiative, University of Pennsylvania. 2016-present.

**Learning Management System Working Group.** Teachers College, Columbia University. 2015.

**Vice Provost for Digital Learning Search Committee.** Teachers College, Columbia University. 2014-2015.

**Faculty Salary Committee.** Teachers College, Columbia University. 2014-2015.

**Learning Sciences Committee.** Teachers College, Columbia University. 2013-2015.

**CIO Search Committee.** Teachers College, Columbia University. 2013-2014.

**Information Security Committee.** Teachers College, Columbia University. 2013-2015.

**Dean's Grants for Students Committee.** Teachers College, Columbia University. 2013-2016.

**Institutional Review Board.** Teachers College, Columbia University. 2013-2016.

**Summer Institutional Review Board.** Teachers College, Columbia University. 2014.



**Seminar Organizer.** Learning Analytics Seminar. Teachers College, Columbia University. 2012-2015.

**Learning Outcomes Coordinator.** Department of Social Science and Policy Studies, Worcester Polytechnic Institute, 2010-2012.

**Graduate Committee.** Department of Social Science and Policy Studies, Worcester Polytechnic Institute, 2009-2012.

**Faculty Review Committee.** Worcester Polytechnic Institute, 2010-2011.

**Seminar Co-Organizer.** (with Sandra Katz) Pittsburgh Science of Learning Center. Carnegie Mellon University/ University of Pittsburgh. 2008.

**Seminar Co-Organizer.** Research and Publication Reading Group. Learning Sciences Research Institute. University of Nottingham. 2006-2007.

**Seminar Organizer.** Human-Computer Interaction Institute PhD lunches. 2002-2004.

## ACADEMIC SERVICE TO THE BROADER RESEARCH COMMUNITY

**Editor.** Founding Editor (with Didith Rodrigo) *Computer-Based Learning in Context*. 2018-Present.

**Board of Directors.** *Academic Development Institute*. 2016-present.

**President.** Founding President. *International Educational Data Mining Society*. 2011-2015.

**Associate Editor.** *Journal of Educational Data Mining*. 2008-Present.

**Associate Editor.** *International Journal of Artificial Intelligence and Education*. 2015-2018.

**Spoke Co-Lead.** Big Data in Education Spoke of the NSF Northeast Big Data Innovation Hub. 2015-present.

**Conference Chair.** *Third International Conference on Educational Data Mining*. Pittsburgh, PA, USA. June 11-13 2010.

**Program Chair,** *18th International Conference on Artificial Intelligence in Education*, 2017.

**Program Chair** (with Dragan Gasevic and Elle Wang). *Second Learning with MOOCs Workshop*. 2015.

**Program Chair** (with Joseph E. Beck). *First International Conference on Educational Data Mining*, Montreal, Canada, June 20-21, 2008.

**Workshop Co-Chair.** Scientific Findings from the ASSISTments Longitudinal Data Challenge. EDM2018.

**Workshop Co-Chair.** replicate.education: A Workshop on Large Scale Education Replication. EDM2018.

**Workshop Co-convener.** Sims and Games Learning Analytics and Educational Data Mining Workshop. New York University, 2013.

**Workshop Co-Chair.** Formative Feedback in Interactive Learning Environments. AIED 2013.

**Workshop Co-Chair.** Workshop on Data Mining for User Modeling. *11<sup>th</sup> International Conference on User Modeling*. 2007.

**Workshop Co-Chair.** Workshop on Educational Data Mining. *8<sup>th</sup> International Conference on Intelligent Tutoring Systems*. 2006.

**Board of Directors.** International Educational Data Mining Society. 2012-present.

**Juror.** McGraw Prize. 2018.

**Program Board.** Adaptive Instructional Systems Conference. 2018-present.

**Steering Committee.** International Conference on Educational Data Mining (EDM) series/ International Educational Data Mining Society. 2006-2011.

**Executive Committee.** International Artificial Intelligence in Education Society. 2011-2023.

**Steering Committee.** Learning Analytics and Knowledge Conference / Society for Learning Analytics Research, 2011-unknown.

**Steering Committee.** ACM Learning @ Scale, 2014-2017.

**Editorial Board.** International Journal of Artificial Intelligence in Education. 2013-present.

**Editorial Board.** International Journal of STEM Education. 2014-present.

**Editorial Board.** Technology, Knowledge, and Learning. 2013-present.

**Editorial Board.** Journal of Writing Analytics. 2016-present.

**Institute Lead.** Learning Analytics Summer Institute. Stanford, California. 2013.

**Special Issue Editor.** Journal of Educational Data Mining. Special Issue of Educational Data Mining on Motivation, Meta-cognition, and Self-regulated Learning. With Phil Winne. 2013.

**Board of Special Reviewers.** User Modeling and User-Adapted Interaction. 2010-present.

**Representative.** Representative to the Board of the International Alliance to Advance Learning in the Digital Era. 2017-Present.

**Program Committee.**

IEEE International Conference on Engineering, Technology, and Education (2018)

Learning Sciences/ICLS (2018)  
Learning with MOOCs Workshop (2018, 2017, 2016, 2014)  
User Modeling and Adaptive Personalization (2009-2019)  
IEEE International Conference on Advanced Learning  
Technologies (2017)  
Affective Computing and Intelligent Interaction (2017 – senior PC,  
2013 – area chair, 2011)  
Learning Analytics (2011-2019)  
aWEAR (2016)  
ACM Learning at Scale (2015, 2014)  
FLAIRS (2014-2017)  
Educational Data Mining (2009-2016, 2017-2018 – senior PC)  
Artificial Intelligence and Education (2018, 2015, 2013, 2011 – senior  
PC, 2009- PC) (Named one of Best Reviewers in 2013)  
ACM Symposium on Applied Computing Track on Intelligent,  
Interactive, and Innovative Learning Environments (2016, 2014,  
2011)  
Intelligent Tutoring Systems (2018, 2016 – senior PC, 2014, 2012, 2010  
– senior PC, 2008) (Named Outstanding Reviewer in 2010)  
Flairs Special Track on Intelligent Tutoring Systems (2008-2015)  
Foundations of Digital Games (2014 – senior PC)  
Digital Game and Intelligent Toy Enhanced Learning (2012, 2010,  
2009, 2007)  
Interactive Virtual Agents (2012)  
Intelligent User Interfaces (2011)  
International Joint Conference on Artificial Intelligence (2011)  
Flairs Special Track on Affective Computing (2011)  
ICCE Conference on AIED/ITS & Adaptive Learning (ICCE) (2018,  
2017, 2016, 2010, 2009, 2008)  
User Modeling (2007)  
Big Data in Education and Learning Analytics, BDELA (Track 7 –  
2017)  
IEEE ICALT (2017)  
IEEE CIG-2018 Special Session on Intelligent Games for Learning  
(2018)  
International Workshop on Data-Driven Educational Game Design,  
CHI (2018)  
Workshop on Online Learning Non-Cognitive Assessments at Scale,  
LAK (2018)  
International Workshop on Context Based Affect Recognition, ACII  
(2017)  
Integrated Analytics: MOOC Post-Course Development Workshop,  
LAK (2017)  
MOOC Post-Course Development Workshop, LAK2017 (2017)  
International Workshop on Teaching Analytics (2016)  
Supporting Dynamic Cognitive, Affective, and Metacognitive Processes  
Workshop, ITS (2016)  
Workshop on Applied and Practical Learning Analytics, EC-TEL  
(2016)  
International Workshop on Affect, Meta-Affect, Data and Learning  
(2015)

Workshop on Integrated Learning Analytics of MOOC Post-Course Development (2017)

Workshop on Graph-based Educational Data Mining (2015)

Workshop on Applied and Practical Learning Analytics (2015)

Workshop on Culturally-Aware Tutoring Systems (2015, 2014, 2013)

Workshop on Non-Cognitive Factors and Personalization for Adaptive Learning (2014)

Workshop on Social, Motivational and Affective Dimensions of Learning through Social Interaction (2014)

Workshop on Knowledge Discovery in MOOCs (2014)

Workshop on Modeling Large Scale Social Interaction in Massively Open Online Courses, EMNLP (2014)

Workshop on Cross-cultural Differences and Learning Technologies for the Developing World (LT4D), AIED (2013)

mooishop, AIED (2013)

Towards Theory and Practice of Teaching Analytics Workshop, EC-TEL (2012)

Workshop on Intelligent Support for Learning in Groups (2014, 2012)

Workshop on Self-Regulated Learning in Educational Technologies, AIED (2013), ITS (2012)

Workshop on Sentiment Discovery from Affective Data, ECML/PKDD (2012)

Workshop on Knowledge Discovery in Educational Data (2011)

International Workshop on Empathic Computing (2015, 2011)

International Workshop on Intelligent Support in Exploratory Environments, ECTEL (2010, 2008), AIED (2009), ICLS (2010)

Workshop on Closing the Affective Loop in Intelligent Learning Environments, AIED (2009)

Workshop on Emotional and Cognitive Issues in ITS, ITS (2008)

International Workshop on Metacognition and Self-Regulated Learning in ITS, ITS (2008)

Workshop on Education Informatics, ECAI (2008)

Workshop on Educational Data Mining, ICALT (2007)

Workshop on Educational Data Mining, AIED (2007)

International Workshop on Applying Data Mining in e-Learning, EC-TEL (2007)

Workshop on Metacognition and Self-Regulated Learning in Intelligent Tutoring Systems, AIED (2007)

#### **Other Conference Reviewing.**

ACM Learning @ Scale (2018)

APS Mind, Technology, Society (2018)

Cognitive Science Society (2017, 2014, 2012, 2011, 2007, 2005, 2003)

Learning Sciences (2016 – senior reviewer, 2014, 2012 – senior reviewer, 2010)

Computer-Human Interaction (2018, 2014, 2012, 2009, 2008, 2007)

American Educational Research Association (2012, 2010, 2009, 2003)

Intelligent Tutoring Systems (2008, 2006, 2002)

Computers in Education (2008, 2006)

Artificial Intelligence in Education (2007, 2005, 2003)

Intelligent User Interfaces (2008)

User Modeling (2007, 2003)  
User Interface Software and Technology (2007)  
Digital Game and Intelligent Toy Enhanced Learning (2007)  
Cognitive Modeling (2004)  
European Cognitive Science Society (2003)  
Learning Sciences Conference (2002)  
Workshop on Social and Emotional Intelligence in Learning  
Environments, ITS (2004)

**Other Journal Reviewing.**

Behaviormetrika (2018)  
Journal of Computer Assisted Learning (2019, 2018, 2017, 2011, 2008,  
2007)  
New Review of Hypermedia and Multimedia (2018)  
ACM Transactions on Computing Education (2017)  
British Journal of Educational Technology (2017)  
IEEE Transactions on Affective Computing (2018, 2017)  
Quality Assurance in Education (2017)  
Learning and Instruction (2018, 2017)  
Journal of Learning Analytics (2018, 2017)  
The Internet and Higher Education (2015)  
Research in Higher Education (2016, 2015)  
Educational Researcher (2015)  
International Journal of Human-Computer Interaction (2015)  
International Journal of Learning Technologies (2015)  
International Review of Research in Open and Distance Learning  
(2018, 2014)  
Computers & Education (2014)  
International Journal of Human-Computer Studies (2014, 2012, 2011)  
Philippines Journal of Science (2014)  
Cognitive Development (2013)  
Journal of the Learning Sciences (2015, 2013, 2012, 2009)  
Computers and Human Behavior (2013)  
International Journal of Design (2013)  
International Journal of Learning Technology (2013)  
Teachers College Record (2012)  
IEEE Transactions on Learning Technologies (2017, 2014, 2012, 2011,  
2010, 2009, 2008)  
ACM Transactions on Interactive Intelligent Systems (2012)  
Journal of Educational and Behavioral Statistics (2012)  
Journal of Educational Computing Research (2012, 2011)  
IEEE Transactions on Systems, Man, and Cybernetics (2012, 2010)  
Computers and Education (2011)  
Journal of Intelligent Information Systems (2011)  
Journal of Intelligent Information Systems (2011)  
International Journal of Artificial Intelligence in Education (2010,  
2006)  
User Modeling and User-Adapted Interaction (2010, 2008, 2007, 2006)  
The Internet and Higher Education (2010)  
Artificial Intelligence Journal (2008)  
ACM Transactions on the Web (2007)

Journal of Visual Languages and Computing (2007)  
Cognition and Instruction (2006)

**Book Reviewing.** Oxford University Press (2011)

**Workshop Organizing Committee.** Turn Theories into Products: Implementation of Artificial Intelligence in Education. *18<sup>th</sup> International Conference on Artificial Intelligence in Education*. 2017.

**Workshop Organizing Committee.** Workshop on Analyzing Student-Tutor Interaction Logs to Improve Educational Outcomes. *7<sup>th</sup> International Conference on Intelligent Tutoring Systems*. Chair: Joseph Beck. 2004.

**Grant Reviewing.** Israel Science Foundation (2012)  
Spencer Foundation (2018)  
VolkswagenStiftung Foundation (2014)  
Hewlett Foundation (2013)  
NSF Social, Behavioral, and Economic Sciences (SBE) (2017, 2016, 2011)  
NSF Computer & Information Science & Engineering (CISE) (2016, 2013, 2012, 2011, 2010, 2009)  
NSF Education & Human Resources (EHR) (2013, 2012, 2011)

## OTHER

**Scientific Advisor.** Pittsburgh Science of Learning Center DataShop (2009-2013)

**Research Lead.** SoLAR Storm – distributed lab for Learning Analytics research students (2012-2013)