

Publications for Michael J Jacobson

2017

Jacobson, M., Markauskaite, L., Portolese, A., Kapur, M., Lai, P., Roberts, G. (2017). Designs for learning about climate change as a complex system. *Learning and Instruction*, In Press/Corrected Proof. [More Information]

Lai, P., Portolese, A., Jacobson, M. (2017). Does sequence matter? Productive failure and designing online authentic learning for process engineering. *British Journal of Educational Technology*, Online first. [More Information]

2016

Lai, P., Jacobson, M., Markauskaite, L. (2016). Agent-Based Models versus video-based visualizations to learn nanoscience concepts: An embodied cognition perspective. *2016 American Educational Research Association (AERA) Annual Meeting*, Washington, D.C.: AERA.

Portolese, A., Markauskaite, L., Lai, P., Jacobson, M. (2016). Analyzing patterns of emerging understanding and misunderstanding in collaborative science learning: A method for unpacking critical turning points. *Transforming Learning, Empowering Learners: 12th International Conference of the Learning Sciences (ICLS 2016)*, Singapore: International Society of the Learning Sciences.

Jacobson, M., Lund, K., Hoadley, C., Vatrappu, R., Kolodner, J., Reimann, P. (2016). Beyond just getting our word out: Creating pipelines from learning sciences research to educational practices. *12th International Conference of the Learning Sciences (ICLS 2016)*, Singapore: International Society of the Learning Sciences.

Jacobson, M., Taylor, C., Richards, D. (2016). Computational scientific inquiry with virtual worlds and agent-based models: new ways of doing science to learn science. *Interactive Learning Environments*, 24(8), 2080-2108. [More Information]

Jacobson, M., Kapur, M., Reimann, P. (2016). Conceptualizing Debates in Learning and Educational Research: Toward a Complex Systems Conceptual Framework of Learning. *Educational Psychologist*, 51(2), 210-218. [More Information]

Portolese, A., Jacobson, M., Duvivier, R., Markauskaite, L. (2016). Redesigning problem-based learning in medical education: Contrasting solutions to improve consolidation. *12th International Conference of the Learning Sciences (ICLS 2016)*, Singapore: International Society of the Learning Sciences.

Markauskaite, L., Jacobson, M. (2016). Tracking and assessing students' learning strategies in model-based learning environments. In Peter Reimann, Susan Bull, Michael Kickmeier-Rust, Ravi Vatrappu, Barbara Wasson (Eds.), *Measuring and Visualizing Learning in the Information-Rich Classroom*, (pp. 137-153). New York: Routledge. [More Information]

Jacobson, M., Markauskaite, L., Portolese, A., Lai, P., Kapur,

M. (2016). Understanding Climate Change as a Complex System with Agent-based Models: A Study of Contrasting Learning Designs. *2016 American Educational Research Association (AERA) Annual Meeting*, Washington, D.C.: AERA.

2015

Jacobson, M. (2015). Authentic Problem Solving and Learning: Lessons Learned and Moving Forward. In Y. H. Cho, I. S. Caleon, M. Kapur (Eds.), *Authentic Problem Solving and Learning in the 21st Century: Perspectives from Singapore and Beyond*, (pp. 347-354). Singapore: Springer Science+Business Media. [More Information]

Kim, B., Pathak, S., Jacobson, M., Zhang, B., Gobert, J. (2015). Cycles of Exploration, Reflection, and Consolidation in Model-Based Learning of Genetics. *Journal of Science Education and Technology*, 24(6), 789-802. [More Information]

Portolese, A., Markauskaite, L., Lai, P., Jacobson, M. (2015). How collaborative successes and failures become productive: An exploration of emerging understanding and misunderstanding turning points in model-based learning with productive failure. *11th International Conference on Computer Supported Collaborative Learning*, Gothenburg, Sweden: International Society of the Learning Sciences.

Portolese, A., Markauskaite, L., Lai, P., Jacobson, M. (2015). Model-based learning with productive failure and analogical encoding: Unpacking learning dynamics with contrasting designs. *2015 Annual Meeting of the American Educational Research Association*, Washington, DC: AERA.

Jacobson, M. (2015). *Modeling complex systems for public policies / Chapter 14: Education as a complex system: Implications for educational research policy*, (pp. 301 - 314). Brasilia, Brazil: Institute of Applied Economic Research (IPEA).

Portolese, A., Jacobson, M. (2015). Optimal sequencing of contrasting cases and procedural instruction in productive failure. *Australian Association for Research in Education (AARE) Annual Conference, 2015*, Fremantle, WA: Australian Association for Research in Education (AARE).

Lai, P., Jacobson, M. (2015). The Value of Using Agent-Based Models For Learning About Nanotechnology. *16th Biennial Conference of the European Association for Research in Learning and Instruction (EARLI)*, Limassol, Cyprus.

Jacobson, M., Kim, B., Pathak, S., Zhang, B. (2015). To guide or not to guide: Issues in the sequencing of pedagogical structure in computational model-based learning. *Interactive Learning Environments*, 23(6), 715-730. [More Information]

Jacobson, M., Markauskaite, L. (2015). Understanding complex systems and climate change: Learning designs With agent-based models, productive failure, and analogical encoding. *2015 Annual Meeting of the American Educational Research Association*, Washington, DC: AERA.

2014

Markauskaite, L., Jacobson, M., Southavilay, V. (2014). An analytic exploration of model-based learning: Insights into inquiry patterns, task structure, time and students' performance ('Analytics for Learning and Becoming in Practice' workshop). *The International Conference of the Learning Sciences (ICLS) 2014*, Boulder, CO: International Society of the Learning Sciences. [More Information]

Levin, J., Jacobson, M., Markauskaite, L. (2014). Combining computational modeling, theory, and data: Steps toward a metamodel framework for the study of learning (Poster). *American Educational Research Association 2014 Annual Meeting*. AERA.

Lai, P., Jacobson, M. (2014). Integrating productive failure into engineering eLearning curriculum design: A pilot study. *American Educational Research Association 2014 Annual Meeting*. AERA.

Jacobson, M., Kapur, M., Reimann, P. (2014). Towards a complex systems meta-theory of learning as an emergent phenomenon: Beyond the cognitive versus situative debate. *The International Conference of the Learning Sciences (ICLS) 2014*, Boulder, CO: International Society of the Learning Sciences.

2013

Jacobson, M., Taylor, C., Richards, D., Lai, P. (2013). Computational Scientific Inquiry With Virtual Worlds and Agent-Based Models: New Ways of "Doing" Science to Learn Science. *2013 Annual Meeting of the American Educational Research Association*, Washington, DC: American Educational Research Association. [More Information]

Uddin, M., Jacobson, M. (2013). Dynamics of email communications among university students throughout a semester. *Computers & Education*, 64, 95-103. [More Information]

Southavilay, V., Markauskaite, L., Jacobson, M. (2013). From "Events" to "Activities": Creating Abstraction Techniques for Mining Students' Model-Based Inquiry Processes. *The 6th International Conference on Educational Data Mining (EDM 2013)*, Memphis, United States: International Educational Data Mining Society.

Gregory, S., Gregory, B., Reiners, T., Fardinpour, A., Hillier, M., Lee, M., Jacka, L., Butler, D., Holloway, D., Jegathesan, J., Jacobson, M., et al (2013). Virtual worlds in Australian and New Zealand higher education: Remembering the past, understanding the present and imagining the future. *30th Australasian Society for Computers in Learning in Tertiary Education Conference: Electric Dreams (ASCILITE 2013)*, Sydney: Macquarie University.

2012

Kelly, N., Jacobson, M., Markauskaite, L., Southavilay, V. (2012). Agent-based computer models for learning about climate change and process analysis techniques. *10th International Conference of the Learning Sciences the Future of Learning*, Sydney: International Society of the Learning Sciences.

Hanna, N., Richards, D., Jacobson, M. (2012). Automatic Acquisition of User Models of Interaction to Evaluate the Usability of Virtual Environments. *Lecture Notes in Computer Science (LNCS)*, 7457, 43-57. [More Information]

Newstead, A., Jacobson, M. (2012). Collaborative Virtual Worlds for Enhanced Collective Scientific Understanding. *Workshop on Distributed Cognition and Distributed Agency*.

Richards, D., Jacobson, M., Porte, J., Taylor, C., Taylor, M., Newstead, A., Kelaiah, I., Hanna, N. (2012). Evaluating the Models and Behaviour of 3D Intelligent Virtual Animals in a Predator-Prey Relationship. *11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2012*, Valencia, Spain: International Foundation for Autonomous Agents and Multiagent Systems.

Jacobson, M., Kapur, M. (2012). Learning Environments as Emergent Phenomena: Theoretical and Methodological Implications of Complexity. In David Jonassen, Susan Land (Eds.), *Theoretical Foundations of Learning Environments (2nd edition)*, (pp. 303-334). New York: Routledge.

Richards, D., Jacobson, M., Taylor, M., Newstead, A., Taylor, C., Porte, J., Kelaiah, I., Hanna, N. (2012). Learning to be Scientists via a Virtual Field Trip (Demonstration). *11th International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2012*, Valencia, Spain: International Foundation for Autonomous Agents and Multiagent Systems.

Jacobson, M., Markauskaite, L., Kelly, N., Stokes, P. (2012). Model-based learning about climate change with productive failure: Preliminary findings. *American Educational Research Association (AERA) Annual Meeting 2012 - Non Satis Scire: To Know Is Not Enough*, Washington, DC: AMERICAN EDUCATIONAL RESEARCH ASSOCIATION.

Rahayu, P., Jacobson, M. (2012). Speaking Self-Efficacy and English as a Foreign Language: Learning Processes in a Multi-User Virtual Environment. In J. Peterson, O. Lee, T. Islam and M. Piscioneri (Eds.), *Effectively Implementing Information Communication Technology in Higher Education in the Asia-Pacific Region*, (pp. 161-181). New York: Nova Science Publishers.

van Aalst, J., Thompson, K., Jacobson, M., Reimann, P. (2012). The Future of Learning: 10th International Conference of the Learning Sciences. Proceedings, Volume 1 - Full Papers. *10th International Conference of the Learning Sciences the Future of Learning*, Sydney: International Society of the Learning Sciences.

van Aalst, J., Thompson, K., Jacobson, M., Reimann, P. (2012). The Future of Learning: 10th International Conference of the Learning Sciences. Proceedings, Volume 2 - Short Papers, Symposia, & Abstracts. *10th International Conference of the Learning Sciences the Future of Learning*, Sydney: International Society of the Learning Sciences.

Markauskaite, L., Jacobson, M., Southavilay, V., Kelly, N. (2012). Using process analysis techniques to understand students' learning strategies with computer models. *American Educational Research Association (AERA) Annual Meeting 2012 - Non Satis Scire: To Know Is Not Enough*, Washington, DC: AMERICAN EDUCATIONAL RESEARCH ASSOCIATION.

2011

Jacobson, M., Taylor, C., Hu, C., Newstead, A., Wong, W., Richards, D., Taylor, M., Kartiko, I., Porte, J., Kapur, M. (2011). Collaborative virtual worlds and productive failure: Design research with multi-disciplinary pedagogical, technical and graphics, and learning research teams. *9th International Conference on Computer-Supported Collaborative Learning (CSCL 2011): Connecting research to policy and practice*, Hong Kong, China: International Society of the Learning Sciences. [More Information]

Wang, M., Jacobson, M. (2011). Guest Editorial - Knowledge Visualization for Learning and Knowledge Management. *Educational Technology and Society*, 14(3), 1-3.

Gregory, B., Gregory, S., Wood, D., Masters, Y., Hillier, M., Stokes-Thompson, F., Bogdanovych, A., Butler, D., Hay, L., Jegathesan, J., Abbas, A., Jacobson, M., Newstead, A., et al (2011). How are Australian higher education institutions contributing to change through innovative teaching and learning in virtual worlds? *Ascilite 2011: Changing Demands, Changing Directions*, Hobart, Australia: University of Tasmania.

Pathak, S., Kim, B., Jacobson, M., Zhang, B. (2011). Learning the physics of electricity: A qualitative analysis of collaborative processes involved in productive failure. *Computer-Supported Collaborative Learning*, 6, 57-73. [More Information]

2010

Reimann, P., Jacobson, M. (2010). Afterword: Opportunities for Transformational Learning. In Michael J. Jacobson, Peter Reimann (Eds.), *Designs for Learning Environments of the Future: International Perspectives from the Learning Sciences*, (pp. 283-285). New York: Springer.

Jacobson, M., Kim, B., Miao, C., Shen, Z., Chavez, M. (2010). Design perspectives for learning in virtual worlds. In Michael J. Jacobson, Peter Reimann (Eds.), *Designs for Learning Environments of the Future: International Perspectives from the Learning Sciences*, (pp. 111-141). New York: Springer.

Jacobson, M., Reimann, P. (2010). *Designs for Learning Environments of the Future: International Perspectives from the Learning Sciences*. New York: Springer.

Jacobson, M., So, H., Teo, T., Lee, J., Pathak, S., Lossman, H. (2010). Epistemology and learning: Impact on pedagogical practices and technology use in Singapore schools. *Computers & Education*, 55(4), 1694-1706. [More Information]

Jacobson, M., Howard, S., Hu, C., Kennedy-Clark, S. (2010). Failure and Success in Sequences of Model-Based Learning: Perspectives From Students and Preservice Teachers. *AERA 2010 Understanding Complex Ecologies in a Changing World*, Online: American Educational Research Association.

Jacobson, M., Reimann, P. (2010). Invention and Innovation in Designing Future Learning Environments. In Michael J. Jacobson, Peter Reimann (Eds.), *Designs for Learning Environments of the Future: International Perspectives from the Learning Sciences*, (pp. 1-15). New York: Springer.

Jacobson, M., Wilensky, U., Reimann, P. (2010). Learning about complexity and beyond: Theoretical and methodological implications for the learning sciences. *International Conference of the Learning Sciences*, Chicago, IL.: International Society of the Learning Sciences.

Kapur, M., Jacobson, M. (2010). Learning as an Emergent Phenomenon: Methodological Implications. *International Conference of the Learning Sciences*, Chicago, IL.: International Society of the Learning Sciences.

Jacobson, M., Kapur, M. (2010). Ontologies as Scale Free Networks: Implications for Theories of Conceptual Change. *International Conference of the Learning Sciences*, Chicago, IL.: International Society of the Learning Sciences.

Jacobson, M., Wood, D., Richards, D., Kennedy-Clark, S.

(2010). Scenario-based multi-user virtual environments (MUVEs) in education. *Ascilite 2010 sydney: curriculum, technology & transformation for an unknown future*, Sydney: University of Queensland.

Kennedy-Clark, S., Jacobson, M., Reimann, P. (2010). Scenario-Based Multi-User Virtual Environments: Productive Failure and the Impact of Structure on Learning. *5th European Conference on Technology Enhanced Learning (EC-TEL 2010)*, Germany: Springer. [More Information]

Jacobson, M., Richards, D., Kennedy-Clark, S., Thompson, K., Taylor, C., Hu, C., Taylor, M., Kartiko, I. (2010). Scenario-Based Muve For Science Inquiry. *16th UniServe Science Annual Conference 2010*, Sydney: University of Sydney.

Jacobson, M., Kapur, M., So, H., Lee, J. (2010). The ontologies of complexity and learning about complex systems. *Instructional Science*, Online, 1-21. [More Information]

2009

So, H., Lossman, H., Lim, W., Jacobson, M. (2009). Designing an online video based platform for teacher learning in Singapore. *Australasian Journal of Educational Technology*, 25(3), 440-457.

Pathak, S., Kim, B., Jacobson, M., Zhang, B. (2009). Failures and successes in collaborative inquiry: Learning the physics of electricity with agent-based models. *9th International Conference on Computer Supported Collaborative Learning (CSCL2009)*, Greece: International Society of the Learning Sciences. [More Information]

2008

Jacobson, M. (2008). A design framework for educational hypermedia systems: theory, research, and learning emerging scientific conceptual perspectives. *Educational Technology Research and Development*, 56(1), 5-28. [More Information]

Azevedo, R., Jacobson, M. (2008). Advances in scaffolding learning with hypertext and hypermedia: a summary and critical analysis. *Educational Technology Research and Development*, 56(1), 93-100. [More Information]

Jacobson, M., Azevedo, R. (2008). Advances in scaffolding learning with hypertext and hypermedia: theoretical, empirical, and design issues. *Educational Technology Research and Development*, 56(1), 1-3. [More Information]

Jacobson, M., Azevedo, R. (2008). Educational Technology Research and Development: Special Issue on Scaffolded Learning with Hypermedia. *Educational Technology Research and Development*, 56(1).

Pathak, S., Jacobson, M., Kim, B., Zhang, B., Deng, F. (2008). Learning the Physics of Electricity with Agent-Based Models: The Paradox of Productive Failure. *16th International Conference on Computers in Education 2008: ICCE Conference on Emerging Research in Technology Enhanced Learning*, Taipei: Asia-Pacific Society for Computers in Education.

Jacobson, M., Miao, C., Kim, B., Shen, Z., Chavez, M. (2008). Research into Learning in an Intelligent Agent Augmented

Multi-user Virtual Environment. *2008 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology*, United States: (IEEE) Institute of Electrical and Electronics Engineers. [More Information]

2007

Jacobson, M., Goldstone, R., Chi, M., Abrahamson, D., Kapur, M., Clancey, W. (2007). Complex Systems and the Cognitive Sciences: Potential for Pervasive Theoretical and Research Implications? *29th Annual Conference of the Cognitive Science Society CogSci 2007*, United States: Cognitive Science Society.

Jacobson, M., Lim, S., Lee, J., Low, S. (2007). Virtual Singapore: Design considerations for an intelligent agent augmented multi-user virtual environment for learning science inquiry. *15th International Conference on Computers in Education ICCE 2007*, The Netherlands: IOS Press.

2006

Jacobson, M. (2006). Beyond compartmentalized curricula in science and mathematics: Educational and research implications of complex systems. *Broadening Research at International Network BRAIN 2006*.

Jacobson, M., Wilensky, U. (2006). Complex Systems in Education: Scientific and Educational Importance and Implications for the Learning Sciences. *Journal of the Learning Sciences*, 15(1), 11-34. [More Information]

Jacobson, M. (2006). *Empirical research into learning in 3d virtual and game environments: Selected review of the literature*.

Jacobson, M. (2006). From Non-Adaptive to Adaptive Educational Hypermedia: Theory, Research, and Methodological Issues. In George D. Magoulas, Sherry Y. Chen (Eds.), *Advances in Web-Based Education: Personalized Learning Environments*, (pp. 302-330). United States: Idea Group Publishing.

2005

Jacobson, M. (2005). Exploring Fundamental Issues in Problem-Oriented Hypermedia. *13th International Conference on Computers in Education ICCE 2005*, The Netherlands: IOS Press.

Kim, H., Lee, J., Jacobson, M. (2005). From human computer interactions to learner centered designs: Issues for development of e-learning systems. *21st International Conference of Human Computer Interaction 2005*. Lawrence Erlbaum Associates, Publishers.

Jacobson, M., Kim, M., Lee, J., Kim, H., Kwon, S. (2005). Learning sciences principles for advanced e-learning systems: Implications for computer-assisted language learning. *Multimedia Assisted Language Learning*, 8(1), 76-115.

Jacobson, M. (2005). *The use of the EduCel Dynamic Knowledge Transfer System at Chiron: An evaluation*.

2004

Jacobson, M. (2004). Cognitive visualisations and the design of learning technologies. *International Journal of Learning Technology*, 1(1), 40-62.

Jacobson, M. (2004). *From Human-computer interactions to science of learning based designs: E-Learning principles for 21st century learning*.

2003

Jacobson, M. (2003). *Models for centers of teaching and learning in the United States: A report on meetings with four directors*.

Jacobson, M. (2003). *The use of the EduCel Dynamic Knowledge Transfer System at the Brookhaven National Laboratory: An evaluation*.

2002

Jacobson, M., Sloan, K., Rockman, S., Char, C. (2002). *The Academic Value of Hands-on Craft Projects in Elementary Schools*.