Joseph E Michaelis

Assistant Professor of Computer Science & Learning Sciences
Department of Computer Science & Learning Sciences Research Institute
University of Illinois at Chicago
1240 W. Harrison Str.
Chicago, IL 60607
Email: jmich@uic.edu

Education and Certification

Ph.D. – Educational Psychology, Learning Sciences (2019)
University of Wisconsin, Madison, WI
Computer Sciences Minor
Educational Graduate Research Scholars Fellow
O'Shea Dissertation Writing Fellow
Committee: Mitchell Nathan (chair), Bilge Mutlu, Dan Bolt, Martina Rau, and Judith Harackiewicz

Master of Science – Educational Psychology (2015)
University of Wisconsin, Madison, WI
Advisor: Mitchell Nathan

Master of Science – Science Education Leadership (2012)
Illinois Institute of Technology, Chicago, IL
Advisor: Norman Lederman

B.S. Philosophy (2004)
University of Wisconsin, Madison, WI

Illinois Educator Certificate (2008 - 2021)
Initial Secondary Teaching: Science - Chemistry (6-12)

Publications and Research

Michaelis, J. E., Siebert-Evenstone, A., Shaffer, D. W. & Mutlu, B. (2020, April). *Collaborative or Simply Uncaged? Understanding Human-Cobot Interactions in Automation*. In CHI 2020, April 25-30, Honolulu, HI.

Michaelis, J. E. & Mutlu, B. (2020, April) *Social Aptitude from an Educational Robot Helps Promote Interest in Science Learning*. Presented at the 2020 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Michaelis, J. E. & Nathan, M. J. (2020, April) *A Case Study of Enculturation Practices that Support Emerging STEM Interest in an Out-of-School Program*. Presented at the 2020 Annual Meeting of the American Educational Research Association, San Francisco, CA.

Michaelis, J. E., & Mutlu, B. (2019, June). *Supporting interest development in science learning with a social robot.* ACM Interaction Design and Children Conference. Boise, Idaho.

Michaelis, J. E., & Mutlu, B. (2018). Reading socially: Transforming the in-home reading experience with a learning-companion robot. *Science Robotics, 3*(21).

Michaelis, J. E., & Mutlu, B. (2018). Social reading: Field study with an in-home learning companion robot. In J. Kay & R. Luckin (Eds.), *Rethinking Learning in the Digital Age: Making the Learning Sciences Count, 13th International Conference of the Learning Sciences (ICLS) 2018*, Volume 1. (pp. 1675-76). London, UK: International Society of the Learning Sciences.

Walkington, C. A., Swart, M.I., Kwon, O.H., Vinsonhaler, R., **Michaelis, J.E.**, Biznak, J.V., Schenck, K.E., McGinty, J.D., Sung, Y., Nathan, M.J. (2018, October). *Kinecting geometric proof concepts using gestures.* In Proceedings of North American Chapter of the International Group for the Psychology of Mathematics Education. Greenville, South Carolina.

Acuna, S., **Michaelis, J. E.**, Roth, J, & Towles, J. (2018, June). *Intervention designed to increase interest in engineering for low-interest, K-12 girls did so for boys and girls.* Paper presented at 2018 ASEE Annual Conference & Exposition, Salt Lake City, Utah.

Michaelis, J. E., Wu, S. P. W., Rau. M. A., Nathan, M. J. (2018, April). *Testing the four-phase interest development survey for Chemistry.* Paper presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY.

Nathan, M. J., Walkington, C., Vinsonhaler, R., **Michaelis, J. E.**, McGinty, J., Binzak, J. V., & Kwon, O., H. (2018, April). *Embodied account of geometry proof, insight, and intuition among novices, experts, and english language learners*. Paper presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY.

Michaelis, J. E. (2017). *The role of interest and motivation in science investigation and engineering design instruction.* Paper commissioned for the National Academies of Sciences, Engineering, and Medicine committee on Science Investigations and Engineering Design for Grades 6-12.

Francis, C. A, **Michaelis, J. E.**, Acuna, S. A. Towles, J. (2017, June). *Impact of biomechanics-based activities on situational and individual interest among K-12 students.* Paper presented at 2017 ASEE Annual Conference & Exposition, Columbus, OH.

Michaelis, J. E., & Mutlu, B. (2017, May). *Someone to read with: Design of and experiences with an in-home learning companion robot for reading*. In CHI 2017, May 06-11, Denver.

Michaelis, J. E., & Nathan, M. J. (2016, June). *Observing and measuring interest development among high school students in an out-of-school robotics competition.* Paper presented at 2016 ASEE Annual Conference & Exposition, New Orleans, LA.

Clinton, V. E., Cooper, J. L., **Michaelis, J. E.**, Alibali, M. W., Nathan, M. (2016). How revisions to mathematical visuals affect cognition: Evidence from eye tracking. In B. Morris, C. Was & F. Sansosti (Eds.) *Eye-Tracking technology applications in educational research*. New York, NY: IGI

Michaelis, J. E., Clinton, V. E., Cooper, J. L., Nathan, M. J., Alibali, M. W. (2016, April) *Cognitive principles for effective uses of visual information improve mathematics learning by encouraging deeper processing*. Presented at the 2016 Annual Meeting of the American Educational Research Association, Washington, D.C.

Michaelis, J. E., & Nathan, M. J. (2015, June). *The Four-Phase Interest Development in Engineering Survey*. Paper presented at 2018 ASEE Annual Conference & Exposition, Educational Research Methods (ERM) Division. Seattle, WA.

Rau, M. A., **Michaelis, J. E.**, & Fay, N. (2015). Connection making between multiple graphical representations: A multi-methods approach for domain-specific grounding of an intelligent tutoring system for chemistry. *Computers & Education*, *82(0)*, 460-485.

Michaelis, J. E., & Nathan, M. J. (2015, April). *The role of feedback in interest development in an out-of-school engineering setting*. Paper presented at the 2015 Annual Meeting of the American Educational Research Association, Chicago, IL

Michaelis, J. E., Nathan, M.J. (2014). The role of feedback in interest development in an out-of-school engineering setting. In Polman, J. L., Kyza, E. A., O'Neill, D. K., Tabak, I., Penuel, W. R., Jurow, A. S., O'Connor, K., Lee, T., and D'Amico, L. (Eds.). *Learning and becoming in practice: The International Conference of the Learning Sciences (ICLS) 2014*, *Volume 3*. Boulder, CO: ISLS. (pp. 1525-1526)

Michaelis, J. E., Radochonski, N., Yang, H., King, D., (2012). Does immediate feedback with the use of a classroom response system increase student achievement on summative assessments? Master's Thesis, Illinois Institute of Technology: Chicago, IL.

Research Grant Writing Experience

I have contributed to writing, developing, and revising significant portions for the following federally funded grant opportunities:

National Science Foundation – IIS Award #1822872

ROBO-VI: A Virtual-Internship-Based Hybrid Learning Technology to Prepare Traditional and Non-Traditional Students to Work with Collaborative Robot
Investigators**:** Bilge Mutlu, David Williamson Shaffer, Andrew Ruis
Period: 2018-2021
Amount: $499,123

National Science Foundation – AISL Award #1906854

STEMMates: Designing Companion Robots with Socially Situated Interest Scaffolds for Informal, In-home STEM Learning
Investigator**:** Bilge Mutlu
Period: 2019-2021
Amount: $300,000

Awards and Honors

Michael Vincent and Harriet Frisbie Eastabrooks O'Shea Fellowship (2018-19)

Competitive $20,000 fellowship award in honor of Michael Vincent O'Shea

National Academy of Education (NAEd)/Spencer Dissertation Fellowship (2018)

Semifinalist

Competitive Conference Travel Awards:

University of Wisconsin Graduate School Student Research Grant Competition (2018)
Educational Psychology Department Travel Grant (2018)
Busk Family Travel Grant (2016)

Teaching Experience

University Level

User Interaction Design and Programming (Computer Science 422) 2019
University of Illinois at Chicago

Science Teacher Education Master's Capstone (Curriculum & Instruction 747) 2019
Human Abilities and Learning (Educational Psychology 301) 2016
Learning Theory and Application (Educational Psychology 711-025) 2015-16
Teaching Assistant – Introduction to Learning Sciences (Educational Psychology 795/796) 2014-16
Guest Lecturer – Introduction to Learning Sciences (Educational Psychology 795) Fall 2017
Guest Lecturer – Human-Computer Interaction (Computer Sciences 770) Fall 2018
University of Wisconsin-Madison

K-12 Level

Instructional Leader – HS Science, 2012-13
Teacher – Physics and Robotics, 11th grade, 2011-13 & Earth Science, 6th Grade, 2008-11
Perspectives Charter School/IIT – Math and Science Academy, Chicago, IL.

Teacher – Physics and Chemistry, 9th and 10th grade, 2006-07
Lancaster High School, Lancaster, TX.

Presentations and Workshops

Michaelis, J. E., & Mutlu, B. (2019). Social reading: Design and development of an in-home learning companion robot. Presented at UW-Madison Day at the Capitol. Madison, WI.

Michaelis, J. E., & Dornfeld-Tissenbaum, C. (2017). Mentoring in writing: Junior-senior partnerships for developing writing skills. Presented at 2nd Annual Learning Sciences Graduate Student Conference. Bloomington, IN.

Michaelis, J. E., & Mutlu, B. (2017). Designing an in-home learning companion robot for reading. Presented at 2nd Annual Learning Sciences Graduate Student Conference. Bloomington, IN.

Michaelis, J. E., & Nathan, M.J. (2013, September). The role of feedback in interest development in an out-of-school engineering setting. Presented at DRP Poster Fair, WCER, Madison, WI.

Lederman, N.G., Lederman, J.S., Bartels, S., King, D., **Michaelis, J. E.** (2013, April). Inquiring minds want to know. Presented at the National Science Teachers Associate National Conference, San Antonio, TX.

Michaelis, J. E., Heitzman, C., (2011, March). When will I ever use this? Incorporating authentic application in the science classroom. Presented at the National Science Teachers Associate National Conference, San Francisco, CA.

Selected Press Coverage

Science News, 2019
Research and opinion sought in "Robots are becoming classroom tutors. But will they make the grade?"

CNN, 2018
Research covered and opinion sought in "The 'dunce robots' of Japan will help children learn"

Discover Magazine, 2018
Research covered in "*Want Your Kids to Read More? Get 'Em a Robot*"

Popular Science, 2018
Research covered in "*Kids aren't reading enough. One solution? Robots.*"

U.S. News & World Report, 2018
Research covered in "*Your Kid's New Reading Buddy Could Be a Robot*"

Education Week, 2018
Research covered in "*Can Buddy Reading With a Bot Help Struggling Students?*"

Inverse, 2018
Research covered in "*With a Robot by Their Side, Kids Understand More of What They're Reading*"

Sciences et Avenir (France), 2018
Research covered in "*Minnie, le robot qui fait lire*"

Professional Workshops

Michaelis, J. E., Condon, M., Albrecht-Malinger, R., (2012, August). Mastering mastery manager: Data driven instruction. Perspectives Charter Schools Network Professional Development, Chicago, IL.

Michaelis, J. E., Parker, M. (2011, January). Holy HOTS! Assessment framework to assessment questions. Presented at Perspectives Charter Schools Network Professional Development, Chicago, IL.

Curriculum Development

Sphero, Inc (2018)
Development of science course investigations, based on NGSS and CS standards, that utilize the Sphero SPRK+ robot as an instructional tool.

Educational Psychology 711-002: Learning Theory & Applications (2015-16)
Learning Sciences principles for pre-service classroom teachers developed in conjunction with UW-Madison faculty
University of Wisconsin-Madison

Science Synergy Course, Perspectives Charter Schools (2008-2013)
Curriculum development for innovative science inquiry course
6th Grade – Engineering and Design in Earth Science
11th Grade – Physics Principles in Robotics Engineering

IPRO: Inter-professional Design Course, Perspectives Charter Schools (2012-2013)
Curriculum developed in conjunction with Illinois Institute of Technology School of Design. The IPRO class is an interdisciplinary design course for IIT undergraduate students. My work modified the curriculum to be implemented as a senior capstone project course at the high school level.

DifQuiz.com – ACT prep online (2011- 2012)
ACT Science Reasoning Test Preparation Development

Service

Learning Sciences Graduate Student Conference (2015-17)

Founding Member and Organizing Committee Member
Submissions Chair

STEMbuds (2015-16)

Undergraduate student group to encourage K-12 interest in STEM
Graduate student adviser

Conference and Journal Review

Journal of the Learning Sciences (2018-2020)
International Journal of Social Robotics (2018)
Computers & Education (2018-2020)
Journal of Pre-college Engineering Education Research (2018)
American Educational Research Association (2017-19)
SIGs: Advanced Technologies for Learning, Learning Sciences, Motivation
Artificial Intelligence in Education Conference (2018)
Interaction Design and Children Conference (2018)
American Society for Engineering Education (2015 - 2018)
K-12 & Pre-College Engineering Division
Computers in Human Behavior (2015-2017)
International Conference on Human-Robot Interaction (2017)
International Conference on Intelligent Tutoring Systems (2016)

Professional Affiliations

American Society for Engineering Education (2015 – present)
American Educational Research Association (2014 – present)
Association for Computing Machinery (2017 – present)
International Society of the Learning Sciences, (2013 – present)
National Science Teachers Association, (2010 – present)

Software & Computer

Expertise/Proficiency in: R, LaTeX, SPSS, C++, Java, Python, Linux, ROS, Office, Adobe Illustrator.