

Ian D. Beatty

ian@ianbeatty.com • <https://ianbeatty.com>

Education

May 2000: **Ph.D. in Physics**, University of Massachusetts Amherst.

- Research area: Physics Education. Dissertation: *ConMap: Investigating New Computer-Based Approaches to Assessing Conceptual Knowledge Structure in Physics*.

May 1990: **B.S. in Physics**, University of Massachusetts Amherst (4.0 GPA).

- *Summa Cum Laude* honors thesis in nuclear theory: $O_1^+ \rightarrow O_2^+$ Electron Scattering Form-Factors in ^{40}Ca and ^{48}Ca .
-

Employment

Jan 2026 – Mar 2026: **Research Fellow**, ERA AIXBio Research Fellowship, Cambridge UK.

Aug 2015 – present: **Associate Professor of Physics** (tenured), University of North Carolina Greensboro. Director of Undergraduate Studies for Physics & Astronomy since Aug 2015.

Aug 2015 – present: **Assistant Professor of Physics**, University of North Carolina Greensboro.

Aug 2015 – present: **Visiting Assistant Professor of Physics**, University of North Carolina Greensboro.

Feb 2006 – Jan 2009: **Research Faculty**, University of Massachusetts Amherst.

Jun 2000 – Feb 2006: **Postdoctoral Research Associate**, University of Massachusetts Amherst.

Feb 1991 – May 2000: **Graduate Assistant**, University of Massachusetts Amherst.

Consulting

Feb 2024 – June 2025: For Apparel Robotics Corp., strategized and developed computational fluid dynamics simulations of a novel airflow-based gripper for robotic manipulation of textiles.

Sep 2015 – Mar 2016: For Cengage Learning, Inc., provided an expert pedagogical review of a new game-inspired user interface being developed for an online physics homework system.

May 2015: For W. W. Norton & Co. Inc., provided an expert pedagogical review of a new game-based technology product being developed for astronomy instruction.

Mar 2012: For Cengage Learning, provided an expert pedagogical review of a new web-based curriculum product being developed for physics instruction.

Feb 2012 – Nov 2016: For the American Association of Physics Teachers, served on the editorial board of *PhysPort* (a compendium of research-vetted instructional resources for physics teachers) providing expert pedagogical reviews and guidance.

Nov 2004 – Mar 2005: For Thomson Learning, Inc., authored and packaged research-based physics curriculum materials to accompany a published physics curriculum, in collaboration with W.J. Gerace and W.J. Leonard.

Awards & Honors

Dec 2009: Reviewer of the Year, *Education as Change* (a South African research journal).

Aug 2009: *Physics Classics Award* for Outstanding Online Teaching Resource, *Multimedia Educational Resource for Learning and Online Teaching* (MERLOT).

May 1995: Arthur Quinton Award for Outstanding Teaching Assistant, University of Massachusetts Amherst.

May 1989: *Hasbrouck Award* for Outstanding Physics Major, University of Massachusetts Amherst Department of Physics & Astronomy.

May 1989: Phi Beta Kappa Key Award, *Phi Beta Kappa*.

May 1989: Sigma Xi Science Award, *Sigma Xi Scientific Research Honor Society*.

Grants Awarded

National Science Foundation grant IUSE-1612053: *Self-efficacy Intervention to Improve STEM Performance* (2016-2020), \$299,937. (Co-PI. Lead PI: W. Gerace. Other Co-PIs: S. Carrino, M. Kane.)

UNCG Undergraduate Research & Creativity Award: *Exploring Hysteresis and Spontaneous Symmetry Breaking in a Rotating Fluid* (2019), \$3,000. (Mentor. Student investigator: P. Hart.)

UNCG Undergraduate Research & Creativity Award: *Can Grandeur Overcome Insecurity? Investigating the Impact of Introductory Astronomy Course Elements on Students' Self-Efficacy* (2019), \$1,500. (Mentor. Student investigator: L. House. Co-mentor: A. Aarnio.)

UNCG Undergraduate Research & Creativity Award: *Experimental Investigation of Spontaneous Polygon Formation in a Rotating Fluid* (2018), \$3,000. (Mentor. Student investigator: K. Schmidt.)

UNC General Administration course redesign grant: *Technology-Mediated Active Learning* (2013-2014), \$40,000. (Lead PI. Co-PI: M. Solér.)

National Science Foundation grant TPC-0456124/TPC-1005652: *Teacher Learning of Technology-Enhanced Formative Assessment* (2005-2011), \$2,499,968. (Co-PI, lead proposal author, and project manager. Lead PI: W. Gerace. Other Co-PIs: W. Leonard, A. Feldman.)

Hewlett-Packard Corp. Applied Mobile Technology Solutions in Learning Environments Grant Initiative: *The Hewlett-Packard Classroom for Technology-Enabled Active Learning* (2003). \$225,510. (Co-PI. Official lead PI: W. Gerace, but I was the proposal author and de facto project director.)

Microsoft Corp. external research grant for mobile computing in the classroom (2003). \$52,098.

Journal Articles & Book Chapters (peer reviewed)

Beatty, I. D. (2013). "Standards-based grading in introductory university physics." *Journal of the Scholarship of Teaching and Learning* 13(2) 1-22. [<https://scholarworks.iu.edu/journals/index.php/josotl/article/view/3264>]

Beatty, I. D. & Feldman, A. (2012). "Viewing teacher transformation through the lens of cultural-historical activity theory (CHAT)." *Education as Change*, 16(2) 283-300. [DOI:10.1080/16823206.2012.745756]

Lee, H., Feldman, A. & Beatty, I. D. (2012). "Factors that affect science and mathematics teachers' initial implementation of Technology-Enhanced Formative Assessment using a classroom response system." *Journal of Science Education & Technology* 21(5) 523-539. [DOI:10.1007/s10956-011-9344-x]

Beatty, I. D. & Gerace, W. J. (2009). Technology-enhanced formative assessment: A research-based pedagogy for teaching science with classroom response technology. *Journal of Science Education & Technology* 18(2) 146. [DOI:10.1007/s10956-008-9140-4]

Beatty, I. D., Leonard, W. J., Gerace, W. J., & Dufresne, R. J. (2006). "Question-Based Agile Teaching: Teaching science (well) with an audience response system." In Banks, D. A. (Ed.), *Audience Response Systems in Higher Education: Applications and Cases*. Idea Group Inc., Hershey PA. ISBN: 1-59140-947-0 (hardcover), 1-59140-948-9 (paperback), 1-59140-949-7 (e-book). [DOI:10.4018/978-1-59140-947-2.ch007]

Beatty, I. D., Leonard, W. J., Gerace, W. J., & Dufresne, R. J. (2006). "Designing effective questions for classroom response system teaching." *American Journal of Physics* 74(1) 31-39. [DOI:10.1119/1.2121753]

Beatty, I. D. & Gerace, W. J. (2002). "Probing physics students' conceptual knowledge structures through term association." *American Journal of Physics* 70(7) 750-758. [DOI:10.1119/1.1482067]

Conference Papers (peer-reviewed, invited, or via peer-reviewed abstract)

Beatty, I. D., Sedberry, S. J., Gerace, W., Strickhouser, J. E., Elobeid, M. A., Kane, M. J. (2020). "Improving STEM self-efficacy with a scalable classroom intervention targeting growth mindset and success attribution." *Proceedings of the 2019 Physics Education Research Conference (PERC)*. College Park, MD: American Association of Physics Teachers. [DOI:10.1119/perc.2019.pr.Beatty]

Sedberry, S. J., Beatty, I. D., Gerace, W., Elobeid, M. A., Strickhouser, J. E. (2020). "Three critical issues that shape and complicate STEM self-efficacy intervention research: Reflections and analysis from an interdisciplinary research team." *Proceedings of the 2019 Physics Education Research Conference (PERC)*. College Park, MD: American Association of Physics Teachers. [DOI:10.1119/perc.2019.pr.Sedberry]

Beatty, I. D. (2016). "Collaboration or copying? Student behavior during two-phase exams with individual and team phases." *Proceedings of the 2015 Physics Education Research Conference (PERC)*, College Park MD, July 29-30 2015. [DOI:10.1119/perc.2015.pr.010]

Beatty, I. D. and Harris, L. A. (2015). "Pwning Level Bosses in MATLAB: Student Reactions to a Game-Inspired Computational Physics Course." *Proceedings of the 2014 Physics Education Research Conference (PERC)*, Minneapolis, MN. [DOI:10.1119/perc.2014.pr.006]

Harris, L. A. & Beatty, I. D. (2013). "Extreme Learning Assistants: The Impact of an Authentic Teaching Experience on Undergraduate Physics Majors." *Proceedings of the 2013 Physics Education Research Conference (PERC)*, Philadelphia, PA. [DOI:10.1119/perc.2013.pr.031]

Grabow, A. J. & Beatty, I. D. (2013). "Extreme Learning Assistants: Students' Perceptions of their Undergraduate TAs." *Proceedings of the 2013 Physics Education Research Conference (PERC)*, Philadelphia, PA. [DOI:10.1119/perc.2013.pr.028]

Beatty, I. D. (2013). "Improving Physics Instruction by Analyzing Video Games." *Proceedings of the 2012 Physics Education Research Conference (PERC)*, Philadelphia, PA. AIP Conference Proceedings 1513, 70. [DOI:10.1063/1.4789654]

Beatty, I. D. & Feldman, A. (2009). "Illuminating teacher change and professional development with CHAT." *Proceedings of the Annual International Conference of the US National Association for Research in Science Teaching (NARST)*, Baltimore, MD. [DOI:10.1080/16823206.2012.745756]

Lee, H., Feldman, A., & Beatty, I. D. (2009). "Teachers' implementation of a classroom response system to perform formative assessment in secondary science/math classes." *Proceedings of the Annual International Conference of the US National Association for Research in Science Teaching (NARST)*, Baltimore, MD. [DOI:10.1007/s10956-011-9344-x]

St. Cyr, K., Beatty, I. D., Feldman, A., Gerace, W. J. & Leonard, W. J. (2009). "Teacher change facilitated by sustained school situated professional development: Exemplar learning of Technology Enhanced Formative Assessment (TEFA)." *Proceedings of the Association for Science Teacher Education (ASTE) International Conference*, St. Louis, MO.

Beatty, I. D., Feldman, A., Lee, H., St. Cyr, K. & Harris, R. (2008). "Teacher learning of technology-enhanced formative assessment." *Proceedings of the Annual International Conference of the US National Association for Research in Science Teaching (NARST)*, Baltimore, MD, Apr 01. [<http://www.eric.ed.gov/ERICWebPortal/detail?accno=ED502258>]

Feldman, A., Beatty, I. D., Leonard, W. J. & Gerace, W. J. (2008). "Technology-Enhanced Formative Assessment: An Innovative Approach To Student-Centered Science Teaching." *Proceedings of the Association for Science Teacher Education (ASTE) International Conference*, St. Louis, MO.

Gerace, W. J. & Beatty, I. D. (2005). "Teaching vs. learning: Changing perspectives on problem solving in physics instruction." *Proceedings of the 9th Common Conference of the Cyprus Physics Association and Greek Physics Association: Developments and Perspectives in Physics–New Technologies and Teaching of Science* (invited), Nicosia, Cyprus, Feb 4–6.

Conference Presentations, Seminars & Colloquia

Sedberry, S. J., Beatty, I. D., Gerace, W., Elobeid, M. A., Strickhouser, J. (2020-01-20). "Increasing Growth Mindset with a Brief, Interactive, Classroom-based Intervention," contributed talk CF03 at the 2020 Winter Meeting of the American Association of the Physics Teachers, Orlando, FL. [[abstract](#)]

Beatty, I. D., Sedberry, S. J., Gerace, W., Kane, M. J., Strickhouser (2019-07-24). "Improving Physics Students' Self-Efficacy with a Brief Mindset Intervention," contributed talk FD03 at the 2019 Summer Meeting of the American Association of the American Association of Physics Teachers, Provo, UT. [[abstract](#)]

House, L., Aarnio, A. N., Beatty, I. D. (2019-07-24) "Legacy of the Pale Blue Dot: Can introductory astronomy experiences impact self-concept and self-efficacy?," a contributed talk at the 2019 Physics Education Research Conference, American Association of Physics Teachers, Provo, UT.

Sedberry, S. J., Beatty, I. D., Gerace, W., Strickhouser, J. E., Elobeid, M. A., (2019-07-24). "Three factors that complicate self-efficacy research and affect whether self-efficacy interventions succeed or fail," a contributed talk at the 2019 Physics Education Research Conference, American Association of Physics Teachers, Provo, UT.

House, L., Aarnio, A. N., Beatty, I. D. (2019-01-08). "Can Grandeur Overcome Insecurity? Seeking Specific Astronomy Course Experiences That Can Diminish Stereotype Threat and Enhance Students Self-efficacy," a contributed talk at the 223rd Meeting of the American Astronomical Society, Seattle, WA.

Sedberry-Carrino, S., Gerace, W., Beatty, I. D., Kane, M. J., Strickhouser, J. E., Elobeid, M. A., Hudson, S. L., Bottini, C. (2018-10-11). "SIISP: Self-Efficacy Intervention to Improve STEM Performance," an invited poster presentation at the STEMM Equality Congress, Amsterdam, Netherlands.

Beatty, I. D. (2016-11-18). "Stealing from the Best: What we can learn from game designers," an invited colloquium for the Department of Physics, Eastern Carolina University, Greenville, NC.

Beatty, I. D. (2015-07-28) "Using Videogame Dynamics, Clickers, and Communities to Reframe Student Engagement" Invited talk DG03 at the American Association of Physics Teachers 2015 Summer Meeting, College Park, MD. [[abstract](#)]

Beatty, I. D. (2014-08-18) "When Game Design Meets Course Design." An invited keynote talk at the 2014 International Conference on Physics Education, Córdoba, Argentina.

Beatty, I. D. (2013-04-25) "When Game Design Meets Course Design (A Theoretical Framework)." An invited talk to The Education Group at the Massachusetts Institute of Technology, Cambridge MA.

Beatty, I. D. (2012-11-22) "Model-building in Physics Education Research: Many goals, many methodologies." An invited talk for the Department of Physics at the Universidad Técnica Federico Santa María, Valparaiso, Chile.

Beatty, I. D. (2011-08-01) "Teaching with clickers: How, for what, and with what mind-set?" Invited talk BB01 at the American Association of Physics Teachers 2011 Summer Meeting, Omaha NE. [[abstract](#)]

Beatty, I. D. (2010-07-20) "Key factors in teachers' success or failure adopting clicker pedagogy." Invited talk GF01 at the Summer Meeting of the American Association of Physics Teachers (AAPT), Portland OR. [[abstract](#)]

Beatty, I. D. & Feldman, A. (2009-04-20). "Co-evolution of practice and pedagogy: A model for science teacher change in the context of professional development," a contributed talk at the Annual Meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

Lee, H., Feldman, A., & Beatty, I. D. (2009-04-18). "Teachers' implementation of classroom response system to perform formative assessment in secondary science/math classes," a contributed talk at the Annual Meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

St. Cyr, K., Beatty, I. D., Feldman, A., Gerace, W. J. & Leonard, W. J. (2009-01-08). "Teacher change facilitated by sustained school situated professional development: Exemplar learning of Technology Enhanced Formative Assessment (TEFA)," a contributed talk at the Association for Science Teacher Education (ASTE) International Conference, Hartford, CT.

Beatty, I. D. (2008-10-24). "How do Physics students access their knowledge?", an invited seminar presented to the faculty and graduate students of the Cognitive Psychology Area of the Department of Psychology, University of North Carolina at Greensboro.

Beatty, I. D. (2008-05-13). "Modeling teacher change," an invited talk for the Bureau of Educational Research, Department of Educational Psychology, and Department of Physics at the University of Illinois, Urbana-Champaign, IL.

Beatty, I. D. (2008-04-22). "Modeling teacher change," an invited talk for the Department of Physics at the University of North Carolina, Greensboro, NC.

Beatty, I. D., Feldman, A., Lee, H., St. Cyr, K. & Harris, R. (2008-04-01). "Teacher learning of technology-enhanced formative assessment," a special symposium presented at the Annual International Conference of the US National Association for Research in Science Teaching (NARST), Baltimore, MD.

Feldman, A., Beatty, I. D., Leonard, W. J. & Gerace, W. J. (2008-03-24). "Technology-Enhanced Formative Assessment: An innovative approach to the teaching and learning of science," a contributed talk at the Annual Meeting of the American Educational Research Association (AERA), New York, NY.

Feldman, A., Beatty, I. D., Leonard, W. J. & Gerace, W. J. (2008-01-10). "Technology-Enhanced Formative Assessment: An Innovative Approach To Student-Centered Science Teaching," a contributed talk at the Association for Science Teacher Education (ASTE) International Conference, St. Louis, MO.

Beatty, I. D. (2007-02-12). "De-trivializing classroom response systems," an invited seminar for the Physics Education Research Group, Department of Physics, The Ohio State University.

Beatty, I. D., Leonard, W. J., Feldman, A., & Gerace, W. J. (2006-07-25). "Illuminating teacher learning of technology-enhanced formative assessment," contributed talk DH05 at the Summer Meeting of the American Association of Physics Teachers (AAPT), Syracuse NY. AAPT Announcer 36(2) 133. [abstract]

Beatty, I. D. (2005-09-27). "Formative assessment and agile teaching: Re-framing physics instruction," an invited talk at the 90th Reunión Nacional de Física of the Asociación Física Argentina, La Plata, Argentina.

Beatty, I. D. (2005-05-02). "Methodologies for cognitive research in physics education," an invited seminar for the Grupo Enseñanza Ciencia y Tecnología, Universidad Nacional de Córdoba, Argentina.

Beatty, I. D., Gerace, W. J. & Leonard, W. J. (2005-01-10) "Designing Effective Questions for Classroom Response System Teaching," contributed talk BL05 at the Winter Meeting of the American Association of Physics Teachers (AAPT), Albuquerque NM. [abstract]

Gerace, W. J. & Beatty, I. D. (2005-01-110) "Agile Teaching: Real-Time Formative Assessment with a Classroom Response System." A contributed talk at the Winter Meeting of the American Association of Physics Teachers (AAPT), Albuquerque NM. [abstract]

Beatty, I. D., Leonard, W. J., Dufresne, R. J. & Gerace, W. J. (2004-08-03) "Bridging Conceptual Understanding to Problem Solving Through Qualitative Analysis Activities." Invited talk DG03 at the Summer Meeting of the American Association of Physics Teachers (AAPT), Sacramento CA. [abstract]

Beatty, I. D., Dufresne, R. J., & Gerace, W. J. (2001-01-11) "ConMap: Investigating Computer-Based Approaches to Assess Conceptual Knowledge Structure." Contributed talk WM01 at the Winter Meeting of the American Association of Physics Teachers (AAPT), San Diego CA. [abstract]

Workshops Designed & Conducted

Beatty, I. D. & Gerace, W. J. (2014-08-19) "Provoking Deep Learning with Clickers and Student Whiteboards," an invited workshop on pedagogy conducted at the *2014 International Conference on Physics Education*, Córdoba Argentina, Aug 18-22.

Beatty, I. D. & Gerace, W. J. (2014-08-08) "TeMAlE Project Workshop #3: Just-in-Time Teaching and Technology-Enhanced Formative Assessment," a workshop hosted by the Faculty Teaching and Learning Commons for faculty and staff at UNCG.

Beatty, I. D. & Gerace, W. J. (2014-01-06) "TeMAlE Project Workshop #2: Designing Effective Questions for JITT and TEFA," a workshop hosted by the Faculty Teaching and Learning Commons for faculty and staff at UNCG.

Beatty, I. D. & Gerace, W. J. (2013-05-15) "TeMAlE Project Workshop #1: Just-in-Time Teaching and Technology-Enhanced Formative Assessment," a workshop hosted by the Faculty Teaching and Learning Commons for faculty and staff at UNCG.

Beatty, I. D. (2013-05-15) "Provoking Deep Learning with Clickers," an invited workshop for the Summer Shorts faculty development institute at North Carolina State University, Raleigh NC.

Beatty, I. D. (2013-03-02) "What do video games have to teach us about teaching and learning?" a talk for physics and astronomy teachers participating in the Symposium on Horizons in Astronomy and Physics Education (SHAPE), University of North Carolina, Chapel Hill, NC.

Beatty, I. D. (2013-02-28) "Provoking deep learning with clickers." An invited workshop for faculty and staff of Appalachian State University, Boone NC.

Beatty, I. D. (2012-11-22) "Provoking deep learning with clickers." An invited workshop for faculty and staff of the Universidad Técnica Federico Santa María, Valparaiso, Chile.

Beatty, I. D. (2012-11-20) "Clickers, whiteboards, group exams, and other tactics for engaging students in active learning." An invited talk for faculty of the Valparaiso campus of the Universidad Técnica Federico Santa María, Chile.

Beatty, I. D. (2012-11-19) "Clickers, whiteboards, group exams, and other tactics for engaging students in active learning." An invited talk for faculty of the San Joaquin campus of the Universidad Técnica Federico Santa María, Chile.

Beatty, I. D. (2012-11-19) "Clickers, whiteboards, group exams, and other tactics for engaging students in active learning." An invited talk for faculty of the Vitacura campus of the Universidad Técnica Federico Santa María, Chile.

Beatty, I. D. (2012-09-01) "Provoking deep learning with clickers." An invited talk for faculty of Elon University (organized by the Office of Teaching and Learning Technologies), Elon NC.

Beatty, I. D. (2012-05-22) "Provoking deep learning with clickers." An invited keynote at the Turning Technologies Learning Forum, Rowan-Cabarrus Community College, North Carolina Research Campus, Kannapolis NC.

Beatty, I. D. (2012-04-09) "New trends in Physics Education Research." An invited colloquium for the Department of Physics, NCA&T University, Greensboro NC.

Beatty, I. D. (2012-03-28) "New ideas from Physics Education Research that could make you rethink your teaching and learning." An invited talk for the UNCG Research and Instruction in STEM Education (RISE) Network, Greensboro NC.

Beatty, I. D. (2012-03-02) "Provoking learning with clickers." An invited talk for the Graduate Teaching Seminar of the UNCG Department of Mathematics and Statistics, Greensboro NC.

Beatty, I. D. (2012-02) "New ideas from Physics Education Research that could make you rethink your teaching and learning." An invited plenary at the 2012 Lilly Conference on College and University Teaching, Greensboro NC.

Beatty, I. D. (2011-10-09). "Raise your game: Provoking more learning with clickers," a workshop for the Teaching and Learning Center at the University of North Carolina, Greensboro.

Beatty, I. D. (2011-02-05) "Hidden perspectives underlying success or failure teaching with clickers." Workshop #128 at the 2011 Lilly Conference on College and University Teaching, Greensboro NC. [[abstract+paper](#)]

Beatty, I. D. (2010-12-28). "That was like, whoa, that was a lightning bolt," a workshop for physics and astronomy teachers participating in the Symposium on Horizons in Astronomy and Physics Education (SHAPE), University of North Carolina, Chapel Hill, NC.

Beatty, I. D. (2009-11-06) "Using clickers and other tools to engage students in active learning, Part 1: The Big Picture," a plenary for the faculty of Johnson & Wales University, Charlotte, NC.

Beatty, I. D. (2009-11-06). "Using clickers and other tools to engage students in active learning, Part 2: Hard-Learned Lessons," a workshop for the faculty of Johnson & Wales University, Charlotte, NC.

Beatty, I. D., Gerace, W. J., Leonard, W. J., & Feldman, A. (2008-11-15). "Technology-enhanced formative assessment (TEFA) with a classroom response system," a workshop at the Inaugural Conference on Classroom Response Systems: Innovations and Best Practices, Delphi Center for Teaching and Learning, University of Louisville, KY.

Leonard, W. J., Beatty, I. D. & Gerace, W. J. (2008-08-19:22). "Getting Started with TEFA," a four-day workshop for science and mathematics teachers from the Westfield Public School District, Westfield, MA participating in the Teacher Learning of Technology-Enhanced Formative Assessment project.

Beatty, I. D., Gerace, W. J., Leonard, W. J. & Feldman, A. (2008-03-29). "Teaching with classroom response technology (clickers)," a workshop at the Annual National Conference of the US National Science Teachers Association (NSTA), Boston, MA.

Phillis, R. W. & Schneider, S. E. & Lavoie, N. & Beatty, I. D. & Maloy, R. W. (2008-03-05). "Writing effective PRS questions," a workshop for the campus community by the "PRS Best Practice Fellows" project of the UMass President's Office and the UMass Amherst Center for Teaching, Amherst, MA.

Beatty, I. D. (2007-12-04). "Teacher Learning of Technology-Enhanced Formative Assessment: A research project involving secondary school science and math, classroom response systems, and teacher professional development," an invited colloquium for the University of Massachusetts STEM Institute, Amherst, MA.

Beatty, I. D. & Gerace, W. J. (2007-11-16). "Teaching Science with Technology-Enhanced Formative Assessment," an invited workshop for Bahamas public school science teachers organized by the Bahamas Ministry of Education, Nassau, Bahamas.

Gerace, W. J. & Beatty, I. D. (2007-11-06). "Question driven instruction with classroom response technology," an invited workshop for Connecticut public school teachers, Greater Hartford Academy of Math and Science, Hartford, CT.

Gerace, W. J. & Beatty, I. D. (2007-10-20). "Question driven instruction with classroom response technology," an invited workshop at the Fall Joint Meeting of the New England Sections of the American Physical Society and the American Association of Physics Teachers (AAPT), University of Connecticut, Storrs, CT.

Leonard, W. J., Beatty, I. D. & Gerace, W. J. (2007-08-14:17). "Getting Started with TEFA," a four-day workshop for science and mathematics teachers from Northampton High School, Northampton, MA participating in the Teacher Learning of Technology-Enhanced Formative Assessment project.

Beatty, I. D. & Gerace, W. J. (2007-06-04). "QDI+TEFA: A radical research-based pedagogy with radical results," a workshop for the Faculty of Education, University of Johannesburg, South Africa.

Beatty, I. D. & Gerace, W. J. (2007-06-02). "Getting started with educational research," a seminar for postgraduate students in the RNA Project, Faculty of Education, University of Johannesburg, South Africa.

Beatty, I. D. & Gerace, W. J. (2007-05-31). "A research project on science teacher professional development," a workshop for the Faculty of Education, University of Johannesburg, South Africa.

Gerace, W. J. & Beatty, I. D. (2007-05-28). "Constructivism: Implications for instruction and learning," part 1 of a workshop for the Faculty of Education, University of Johannesburg, South Africa.

Beatty, I. D. & Gerace, W. J. (2007-05-28). "Formative assessment and dialogical discourse: Magic keys to constructivist, student-centered instruction," part 2 of a workshop for the Faculty of Education, University of Johannesburg, South Africa.

Leonard, W. J., Beatty, I. D. & Gerace, W. J. (2006-08). "Getting Started with TEFA," a three-day workshop for science and mathematics teachers from Frontier Regional School, South Deerfield, MA participating in the Teacher Learning of Technology-Enhanced Formative Assessment project.

Gerace, W. J. & Beatty, I. D. (2006-05-25). "Agile teaching of physics," a workshop for science teachers at the Makerere University Experimental School, Kampala, Uganda.

Gerace, W. J. & Beatty, I. D. (2006-05-05). "Agile teaching of physics," a workshop for faculty and in-service science teachers at the University of KwaZulu-Natal, Durban, South Africa.

Gerace, W. J. & Beatty, I. D. (2005-11-25). "Learning to think with physics: A minds-on and hands-on approach to physics instruction," an invited seminar for the Pedagogical Institute, Nicosia, Cyprus.

Gerace, W. J. & Beatty, I. D. (2005-11-21:24). "A constructivist approach to promoting active learning in secondary physics classes," a series of four invited workshops for physics teachers organized by the Cyprus Ministry of Education in Nicosia, Larnaka, Pafos, and Limassol, Cyprus.

Gerace, W. J. & Beatty, I. D. (2005-05-04:12). "Learning versus Teaching: What every professor should know about science instruction," an intensive short graduate course for faculty and in-service teachers of the Facultad de Ciencias Químicas, Universidad Nacional de Córdoba.

Gerace, W. J. & Beatty, I. D. (2005-04-29). "Teaching vs. Learning: A research-based approach to science instruction," an invited workshop for pre-service science teachers at Universidad Nacional de San Luis.

Poster Presentations

Beatty, I. D., Abel, G. (2026-03-16). "Efficient Classification of DNA Sequences for Synthesis Order Screening," a poster presented at the Cambridge Biosecurity Hub's *AI x Biosecurity Symposium* in Cambridge, UK. [[poster](#)]

Sedberry, S. J., Beatty, I. D., Gerace, W., Elobeid, M. A., Strickhouser, J. (2020-01-20). "Increasing Growth Mindset with a Brief, Interactive, Classroom-based Intervention," poster PST1D05 at the 2020 Winter Meeting of the American Association of the Physics Teachers, Orlando, FL. [[abstract](#)]

Beatty, I. D., Sedberry, S. J., Gerace, W., Kane, M. J., Strickhouser (2019-07-24). "Improving Physics Students' Self-Efficacy with a Brief Mindset Intervention," poster PST2B30 presented at the 2019 Summer Meeting of the American Association of the American Association of Physics Teachers, Provo, UT. [[abstract](#)]

Beatty, I. D. (2014-07-31). "Learning in Video Games: A Model to Inform Instructional Design," a poster presented in the targeted poster session "Game-Based and Game-Informed Approaches to Physics Instruction" at the 2014 Physics Education Research Conference, Minneapolis MN, July 30-31. [[abstract+poster](#)]

Beatty, I. D. & Harris, L. A. (2014-07-31). "Pwning Level Bosses in MATLAB: Student Reactions to a Game-Inspired Computational Physics Course," a poster presented at the 2014 Physics Education Research Conference, Minneapolis MN, July 30-31. [[abstract+poster](#)]

Harris, L. A. & Beatty, I. D. (2013). "Extreme Learning Assistants: The Impact of an Authentic Teaching Experience on Undergraduate Physics Majors." A poster presented at the 2013 Physics Education Research Conference (PERC), Portland, OR. [[abstract+poster](#)]

Grabow, A. J. & Beatty, I. D. (2013). "Extreme Learning Assistants: Students' Perceptions of their Undergraduate TAs." A poster presented at the 2013 Physics Education Research Conference (PERC), Portland, OR. [[abstract+poster](#)]

Beatty, I. D. (2012-08-01). "Improving physics instruction by analyzing video games," a poster presented at the 2012 Physics Education Research Conference, Philadelphia PA, Aug 1-2, 2012. [[abstract+poster](#)]

Beatty, I. D. (2010-12-01). "Teacher learning of technology-enhanced formative assessment" a poster presented at the 2010 National Science Foundation DR K-12 Principal Investigators' Meeting, Washington DC, Dec 1-3, 2010.

Beatty, I. D. (2009-07-17). "Clickers need theory, too!", a poster presented at the Foundations and Frontiers of Physics Education Research conference, Bar Harbor ME.

Harris, R., Lee, H., St. Cyr, K., Beatty, I., Feldman, A., Gerace, W., & Leonard, W. (2008-06-13). "Technology-enhanced formative assessment: A study of teacher change," a poster presented at the University of Massachusetts Amherst School of Education Centennial, Amherst MA, June 13.

Ortiz, E. L., Beatty, I. D., Dufresne, R. J. & Gerace, W. J. (2007-08-01). "Using artificial neural networks to predict how students answer questions in physics," contributed poster CP-56 at the Physics Education Research Conference of the Summer Meeting of the American Association of Physics Teachers (AAPT), Greensboro NC.

Dufresne, R. J., Gerace, W. J., Leonard, W. J., Mestre, J. P. & Beatty, I. D. (2007-09). "Assessing-to-Learn Physics (A2L)," a poster presented at the 2007 National Science Foundation DRK-12 meeting in Crystal City, VA.

Leonard, W. J., Beatty, I. D., Gerace, W. J. & Feldman, A. (2007-09). "Teacher Learning of Technology Enhanced Formative Assessment (TLT)," a poster presented at the 2007 National Science Foundation DRK-12 meeting in Crystal City, VA.

Beatty, I. D., Leonard, W. J., Gerace, W. J. & Feldman, A. (2006-07-26). "Teacher learning of technology-enhanced formative assessment," contributed poster EJ07-24 at the Summer Meeting of the American Association of Physics Teachers (AAPT), Syracuse NY. [[abstract](#)]

Ortiz, E. L., Gerace, W. J., Dufresne, R. J., & Beatty, I. D. (2006-07-25). "Investigating learning capabilities of artificial neural networks," contributed poster EJ04-01 at the Summer Meeting of the American Association of Physics Teachers (AAPT), Syracuse NY. AAPT Announcer 36(2) 150.

Leonard, W. J., Beatty, I. D., Gerace, W. J. & Feldman, A. (2006-05). "Teacher Learning of Technology Enhanced Formative Assessment (TEFA-TL)," a poster presented at the 2006 National Science Foundation TPC meeting in Reston, VA.

Conference Sessions Organized

For the 2014 Physics Education Research Conference, I proposed and organized an invited poster session on "Game-Based and Game-Informed Approaches to Physics Instruction," in which I and four other researchers presented posters on various aspects of this emerging research frontier. (The session, though running in parallel with three others, was very well attended; it filled the room with over 40 participants.)

For the 2013 Summer Meeting of the American Association of Physics Teachers, I proposed and organized an invited parallel session on “Methodologies for identifying and investigating cognitive ‘resources’ in physics thinking,” in which four scholars presented research results and thinking on one of the cutting-edge topics in PER. (The session was quite well attended – standing room only – drawing more than 80 attendees at any given time, with over 100 total.)

Preprints & Reports

Beatty, I. D. (2013). “Gaming the System: Video Games as a Theoretical Framework for Instructional Design.” [ArXiv:1401.6716](#) [[physics.ed-ph](#)].

Beatty, I. D. (2008). “TPPI: The TLT Pedagogical Perspectives Interview.” Amherst, MA: University of Massachusetts Scientific Reasoning Research Institute, [technical report beatty-2008tpp](#).

Corrada-Emmanuel, A., Beatty, I. D., & Gerace, W. J. (2007). “Group Discovery with Multiple-Choice Exams and Consumer Surveys: The Group-Question-Answer Model.” Amherst, MA: University of Massachusetts Department of Computer Science, [technical report UM-CS-2007-047](#).

Additional Professional Training

Nov 2025 – Jan 2026: [Biosecurity](#) course by BlueDot Impact (certificate available).

Aug – Nov, 2023: [Coursera Neural Networks and Deep Learning](#) specialization by DeepLearning.AI (five courses, certificate of successful completion available).

Oct 14 – 28, 2021: [Private Sector Climate Service Providers Academy](#) by the American Society of Adaptation Professionals.

Jan 23 – July 9, 2020: [Mastering En-ROADS webinar series](#) by Climate Interactive.

September 2019: [US Climate Resilience Toolkit Training Workshop](#), conducted by NOAA and UNC Asheville’s NEMAC in Asheville, NC.

Professional Memberships

Oct 2020 – present: *American Society of Adaptation Professionals* (ASAP).

Dec 2018 – present: *Partnership for Integration of Computation into Undergraduate Physics* (PICUP).

Oct 2014 – present: *American Association for the Advancement of Science* (AAAS).

Sep 2004 – Sep 2022: *American Association of Physics Teachers* (AAPT).

Jan 2008 – Dec 2010: *National Association for Research on Science Teaching* (NARST).
