

Patrick James Herak

Senior Lecturer

Department of Engineering Education, The Ohio State University

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EDUCATION:

Master of Arts, Foreign, Secondary, Multilingual Language Education (expected AU2020). The Ohio State University, Columbus, Ohio. Non-Thesis.

Doctor of Philosophy, STEM Education (December 2010). The Ohio State University, Columbus, Ohio.
Dissertation - "Construction and Validation of an Instrument to Measure Problem-Solving Skills of Suburban High School Physical Science Students"

Master of Science, Civil Engineering (May 2016). The Ohio State University, Columbus, Ohio. Thesis - "A Comparison of Several Models for Determining Critical Source Areas in the Context of Seasonal Variation"

Master of Science, Environmental Science (August 2001). The Ohio State University, Columbus, Ohio.
Thesis - "A Comparison of Two Trapping Techniques to Assess Moth Numbers at Sites in Mixed-Oak Forests."

Bachelor of Science in Education, Physics (March 1996). The Ohio State University, Columbus, Ohio.

PROFESSIONAL CREDENTIALS/ENDORSEMENTS:

Collaborative Institutional Training Initiative (CITI), ID 253788, Expires 5/9/2023

5-Year Professional License – Comprehensive High School (7-12), ID OH1183711, Expires 6/30/2024

- Earth Science (9-12)
- All Sciences (7-8)
- Biological Science (9-12)
- TESOL Endorsement (expected Summer 2020)
- Chemistry (9-12)
- General Science (9-12)
- Physics (9-12)

TEACHING EXPERIENCE:

The Ohio State University, Department of Engineering Education (EED) (formerly Engineering Education Innovation Center - EEIC).

- Senior Lecturer (2015-present)
- 1182 Course Coordinator (2017-present)
- College of Engineering Outcomes and Assessments Committee (2017-present)
- Resident Director ENGR 5797.13 Engineering the Castles and Cathedrals of England and Wales (2019-present)
- Ad-Hoc ELL committee (2016-2018)
- Research Committee (2015-2017)
- Exam Committee, High School Liaison (2015-2016)
- Search Committee (2015-2016)
- ENGR 1181 Curriculum Revision Committee, Orientation Committee (Summer 2015)
- Denman Forum Judge (2016)
- Graduate Teaching Assistant (2014-2015)
- STEP Mentor (2016-2019)

Ashland University (2011-2016). 1900 E. Dublin Granville Road. Columbus, OH 43229.

- Adjunct Professor, EDCI 432 Grades 7-12 Methods: Science, EDCI 318 Teaching 21st Century Adolescents: Science

Dublin City Schools (2012-2013). 7030 Coffman Road, Dublin, OH 43017.

- Science Teacher
- Co-developer of online biology course

Central Ohio Technical College (2012). 1179 University Drive, Newark, OH 43055.

- Adjunct Professor, Biology 1730: Environmental Science
- Dual Enrollment Course with Westerville City Schools

Westerville City School District (1997-2012). 936 Eastwind Drive, Westerville, Ohio 43081.

- Science Teacher
- Site Council
- Recycle Club Advisor
- Curriculum Committee
- Science Fair Advisor

The Ohio State University, Department of Teaching and Learning (2005-2006).

- Graduate Teaching Assistant. STEM Education.

Aldenham School (2004-2005). Elstree, Herts, UK, WD6 3AJ.

- Physics Teacher
- House Tutor

Bloom Carroll Local Schools (1996-1997). 5240 Plum Rd NW, Carroll, Ohio 43112.

- Science Teacher
- Science Fair Advisor

PUBLICATIONS:

Herak, P.J., West, M.E., Hylton, J.B., France, T. & Wellman, B. (2020). Assessing Problem-Framing Skills in Secondary School Students Using the Needs Identification Canvas. Paper presented at American Society for Engineering Education, 2020 Virtual Conference.

West, M.E., Hylton, J.B., Herak, P.J., & Wellman, B. (2020). Evaluation of Engineering Problem-Framing Professional Development for K12 Science Teachers. Paper presented at American Society for Engineering Education, 2020 Virtual Conference.

Herak, P.J. (2018). Good Musicians are also “STEAMaticians”. The Instrumentalist. October 2018.

Abell, T. (2017). How It Works: Vending Machines. Mankato, MN: North Star Editions. (Content Consultant, Patrick Herak)

Harper, K. A., & Herak, P. J. (2016). MIND THE GAP. ASEE Prism, 26(4), 43.

Herak, P.J. & Parris, K. (2016). Work-in-Progress — Use of Multiple Tools to Evaluate Student Teamwork Skills. First-Year Engineering Experience Conference. Columbus, OH.

Herak, P., Schlosser, P, & Stutzman, R. (2015). Course Website Analysis: Using Google Analytics to Evaluate Student Experience. Roanoke, VA: *First Year Engineering Experience Conference*, Session T2C. (peer-reviewed)

Liu, H., Gopalakrishnan, S., Browning, D., Herak, P., & Sivandran, G. (2014). Estimating the impact of water quality on surrounding property values in Upper Big Walnut Creek Watershed in Ohio for

dynamic optimal control. Agricultural and Applied Economics Association Annual Meeting. (peer-reviewed)

Herak, P.J. (2005). The logistics of implementing a cross-curricular problem-based learning unit. In Berlin, D. F., & White, A. L. (Eds.). *Collaboration for the Global Improvement of Science and Mathematics Education*. Columbus, OH: International Consortium for Research in Science and Mathematics Education, 64-68.

Zitzewitz, et al. (2005). *Physics: Principals and Problems*. New York, N.Y.: Glencoe/ McGraw-Hill. (Lab Writer and Chapter Content Editor)

Aldridge, B., et al. (1998). *Science Interactions: Course 3*. New York, N.Y.: Glencoe/ McGraw-Hill. (Chapter Content Editor)

GRANTS/AWARDS:

2018 Promoting Engineering Problem Framing Skill Development in High School Science and Engineering Courses. Collaboration with Ohio Northern University and Olathe Schools (KS). NSF Grant. \$449,886.

2017 Creative Writing & Arts Contest Entry, 1st Place – 3D Art, Department of Engineering Education, The Ohio State University.

2015 Nominated for Graduate Associate Teaching Award, The Ohio State University.

2012 Dublin Education Foundation (\$691) “Assessing populations and biodiversity of flying insects at JOEC”.

2011 Westerville Education Foundation (\$1000) “Soaking Up Science and Sustainability with a Rain Garden”.

2009 Sarah Krause Memorial Science Fund (\$500) “Large-Scale Organic Tea Brewer.

2009 Westerville Education Foundation (\$650) “Completing the Circle: Investigations into Vermicomposting”.

2009 Sarah Krause Memorial Science Fund (\$600) “Westerville North/Westerville Metroparks Community Partnership”.

2008 Weyerhaeuser Grant (\$13,000) “Integrating Smartboards in Freshman Science Classrooms).

SCHOLARLY PRESENTATIONS:

Grzybowski, D., Herak, P.J., & Tang, D. (2020). Integrating Entrepreneurial Minded Learning in a First Year Engineering Course at OSU. The Ohio State University, Department of Engineering Education, Seminar Series. Columbus, OH.

Herak, P.J. (2019). Introduction to EML, Undergraduate Studies and Learning Infrastructure Sharing Session.

Herak, P.J., Herman, J., & Wahlin, L. (2019). Audience and Purpose: Making Science and Technology Writing Meaningful, International Consortium for Research in Science and Math Education Session.

Herak, P.J., Herman, J., & Wahlin, L. (2019). Focusing on Audience and Purpose to make STEM Writing Meaningful, Science Education Council of Ohio Symposium.

Droste, D. & Herak, P.J. (2018). Chappaqua Orchestra, Young People’s Concert, Invited presenter, “Music is Science”. Chappaqua, NY.

Herak, P.J. (2018). Finding Life Balance in Teaching: Knowing Yourself and Looking for the Overlap. The Ohio State University, Department of Engineering Education, Seminar Series. Columbus, OH.

Herak, P.J. & Froyd, J. (2017) "Assessing Professional Skills". ASEE, Technical Session.

Herak, P.J. (2017) Bellefontaine High School, Invited Speaker, "Engineering your Music Practice". Bellefontaine, OH.

Herak, P.J. (2016). K-12 Series – Strategies for Smooth Transitions from High School to First-Year Engineering. First-Year Engineering Experience Conference. Columbus, OH.

Herak, P.J. (2016). Training Days: Inadvertent lessons instructors teach students and vice-versa. The Ohio State University, Department of Engineering Education, Seminar Series. Columbus, OH.

Herak, P.J. & B.A. Nguyen (2016). Implementing the Engineering Design Process in Your Classroom. NSTA Regional Conference. Columbus, OH.

Herak, P.J. (2016). Concordia Lutheran High School, Invited Speaker, "Music through the eyes of an Engineer". Fort Wayne, IN.

Herak, P.J. (2016). Science Education Council of Ohio (SECO) Annual Conference, presenter. Columbus, Ohio.

Droste, D. & Herak, P.J. (2015). Fox Valley Orchestra, Young People's Concert, Invited presenter, "Music is Science. Aurora, IL.

Droste, D. & Herak, P.J. (2014). Muncie Symphony Orchestra, Young People's Concert, Invited presenter, "Music is Science". Muncie, IN.

Herak, P.J. (2010-2012). The Ohio State University MSAT Program, Invited Speaker, "Place-Based" Education, Westerville, OH.

Herak, P.J. (2012). National Science Teacher Association (NSTA) National Conference, presenter. Indianapolis, IN.

Herak, P.J. & Villanova, J. (2012). Ohio Music Education Association (OMEA) State Conference, presenter. Columbus, Ohio.

Herak, P.J. (2010). International Consortium for Research in Science and Math Education (ICRSME), Presenter. La Manzanilla, MX.

Herak, P.J. (2008). International Consortium for Research in Science and Math Education (ICRSME), Presenter. Quito, Ecuador.

Herak, P.J. (2004). International Consortium for Research in Science and Math Education (ICRSME), Presenter. Concepcion, Chile.

Herak, P.J. (2003). Science Education Council of Ohio (SECO) Annual Conference, presenter. Dayton, Ohio.

Herak, P.J. (2001). National Science Teacher Association (NSTA) Regional Conference, presenter. Columbus, Ohio.

Herak, P.J. (2001). Science Education Council of Ohio (SECO) Annual Conference, presenter. Cincinnati, Ohio.

Herak, P.J. (2000). Science Education Council of Ohio (SECO) Annual Conference, presenter. Cleveland, Ohio.

Herak, P.J. (1999). Science Education Council of Ohio (SECO) Annual Conference, presenter. Dayton, Ohio.

PROFESSIONAL AFFILIATIONS:

Electronic Journal for Research in Science and Mathematics Education, Reviewer (2020-Present)

Columbus School Board, NSDP Committee (2019-Present).

Ohio Department of Education (2018-2019). 6-12 Physical Science Standards Writing Team.

Science Education Council of Ohio (1995-2004, 2010-present). SECO President 2015-2016.

National Science Teachers Association (2001-2004, 2011-present) - Conference Planning Committee (2015-2016). Local Area Coordinator.

First Year Engineering Education Conference (2015-present). Presenter and paper reviewer. 2016 Local Planning Committee.

American Society for Engineering Education (2014-present). Abstract and paper reviewer.

National Congress on Science Education (2014-2015). Ohio Alternate, Delegate.

Columbus Metroparks Educational Advisory Committee (2011-2017).

Westerville Education Association (1997-2004, 2006-2012).

American Association of Physics Teachers (1996-1998).

ADDITIONAL EDUCATIONAL STUDIES & LEADERSHIP ACTIVITIES:

Spanish Immersion Program. (May 2017). Institute for Second Language Acquisition, San Juan, Puerto Rico.

AP Environmental Science Workshop (July 2010). Wright State University, Dayton, Ohio.

Instructional Strategies Designed for Block Schedules (November 2002). Bureau of Education & Research, Columbus, Ohio.

Spanish Immersion Program. (Summer 2002). Baja California Language College, Ensenada, Mexico.

Special Problems in Economics (Autumn 2001). University of Cincinnati, Ohio.

Entry Level Teacher Mentor Program (March 2001). Westerville City Schools, Westerville, Ohio.

Pathwise Training (Autumn 2000). Westerville City Schools, Westerville, Ohio.

Project Wet (May 2000). The Ohio State University, Columbus, Ohio.

Ohio Project Wild (May 2000). The Ohio State University, Columbus, Ohio.

Project Learning Tree – Ohio (April 2000). The Ohio State University, Columbus, Ohio.

Ohio's Mineral Industries & The Environment Workshop (Summer 1999). University of Akron, Ohio.

Workshop in Curriculum Development (Summer 1997). Ohio University (Lancaster), Ohio.

Ohio State University Marching Band (Member 1991-1995). Head of Baritone Cheers (1993-1995), Assist with Summer Sessions (1994-1995), and First Baritone Soloist (1993).

ENTREPRENEURIAL & BUSINESS EXPERIENCE:

North American Brass Band Association. Vice President 2018-Present, Board Member 2018-present, 2013-2015, and 2007-2009.

Dublin Community Bands (2010, Co-founder). Board of Directors 2010-present.

- Past Treasurer; Past Vice President; Past Secretary; Current Board Member at Large
- Dublin Silver Band (formerly Ohio Brass Band, 2008). Co-founder, Band Manager 2010-2019
- Dublin Youth Brass Band (2015, Founder). Band Manager 2015-Present
- Dublin Metro Brass (2018, Founder). Operations Committee 2018-Present
- Dublin Cornet Band. Member 2010-present, Director 2017-Present
- Lead Grant Writer for 2018 & 2019 Grants (\$10,500 and \$2,000 respectively)

Ohio Academy of Science, Believe in Ohio program (2014–2016). 1500 W. 3rd Avenue, Suite 227, Columbus, Ohio 43212.

- Central Ohio, Regional STEM Advocate
- Leader of teacher professional development and liaison with school teachers, administrators and principals

Ohio Brass Arts Festival (2007, Founder; Executive Director 2007-2009; Associate Director 2010-2012).

“Baritones to the Fore” (2008). Executive Producer (Niche Market CD), ~750 units sold.

OTHER EMPLOYMENT:

The Ohio State University (Columbus, OH), Graduate Research Assistant, Civil Engineering (2013-2014).

Funutation Tekademy (Beachwood, OH), TekLab Leader (2013)

Glencoe (a division of McGraw-Hill Companies), Editing Staff and Lab Writer (Summer 1996, Summer 2003-2004, 2012-4).

The Ohio State University (Columbus, OH), Lab Assistant, Entomology (Summer 2000).

Columbus Zoo (Powell, OH), Show Staff & Educational Outreach (Summer 1994-1996, 1998).

The Ohio State University (Columbus, OH), Lab Assistant, Science Education (Autumn 1994 - Spring 1995).

The Ohio State University (Columbus, OH), Lab Aid, Mechanical Engineering (Summer 1993).