PERC 2020 Presentations

Contributed Poster Presentation Abstracts

Akinyemi, Abolaji, **A tale of two approaches: Comparison of evaluation strategies in physics problem solving between first- and third-year students**

Allen, Patricia E., **Longitudinal E-CLASS Study of Physics Majors at a Masters-granting, Comprehensive University**

Altermatt, Ellen, **Teaching Experience, Community of Practice Beliefs, and Teaching Strategies Predict Perceived IPLS Course Effectiveness**

Amin, Bahar, **STEM Students’ Self-Efficacy and Sense of Belonging in Introductory Physics Labs**

Amos, Nathaniel, **Excerpts from an exploratory survey of units/dimensional analysis in introductory physics**

Archibeque, Benjamin, **Analyzing discussions of under-representation in a high school classroom**

Arielle, Acacia, **Student ownership of lab projects: evolution across temporal project phases**

Barthelemy, Ramón, **Graduate programs in physics education research: A USA based survey**

Bauman, Lauren C., **Identifying student conceptual resources for understanding electric current**

Bayat Barooni, Amin, **Investigating student design engagement in research-based activities**

Bender, Lydia G., **How Faculty Take Up Ideas from a Professional Development Program**

Bennett, Michael B., **Toward a Comprehensive Characterization of Pedagogy in Informal Physics Learning Spaces**

Blackmon, Lena, **Characterizing the mathematical problem-solving strategies of advanced novice physics students**

Bott, Theodore E., **Navigating computational thinking practices for high school physics curricula**

Boudreaux, Andrew, **Toward a framework for the natures of proportional reasoning in introductory physics**

Bradbury, Forrest R., **Open-inquiry experiments using sensors controlled by Arduinos in a pandemic-resilient lab course**

Breakall, Jared B., **Maybe we aren’t that different after all: Faculty perceptions of grade 7-12 teaching as a career**

Broadfoot, Cheyenne, **Identifying student resources for understanding kinematics**

Bugge, Danielle, **The long-term effects of learning in an ISLE approach classroom**

Bunde, Jan-Philipp, **Evaluating secondary school students’ interest and conceptual understanding of circuits**

Burkholder, Eric, **Hidden variables: predicting student performance in introductory physics**

Canright, Jared, **Leveraging virtual reality for student development of force models in the introductory lab**

Cao, Ying, **Emergent Explicit Group Regulation in Scientific Inquiry**

Cao, Ying, **Shared Resources in Student Understanding of Spherical Unit Vectors in Upper-division E&M**

Cardinot, Adriana, **An investigation of Irish students’ alternative conceptions of astronomy**

Chen, Zhongzhou, **Exploring the relation between students’ online learning behavior and course performance by incorporation of contextual information in data analysis**

Christman, Devon M, **Supporting undergraduate facilitators to strengthen physics outreach programs**

Christman, Elaine, **Exploring the CLASS with Item Response Theory**

Cochran, Geraldine L., **A framework for improving diversity work in physics**

Conlin, Luke, **From ‘having a day’ to doing astronomy: Supporting families learning together**

Corsiglia, Giaco, **Characterizing and monitoring student discomfort in upper-division quantum mechanics**

Cowan, Erika, **Using Deliberate Innovation Methodologies to Enable Graduate Student Success**

Crossette, Nate, **Investigating how graduate students connect microstates and macrostates with entropy**

Cwik, Sonja, **How the learning environment predicts male and female students’ motivational beliefs in algebra-based introductory physics**

Dalka, Robert, **Scaffolding Collective Reflection in a Physics Education Research Group**

DeStefano, Paul, **Rapid creation and assessment of introductory physics laboratory curriculum for distance-learning**
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Doty, Constance M., Impact of changing physical learning space on GTA and student behaviors
Doucette, Danny, What Makes a Good Physics Lab Partner?
Dounas-Frazer, Dimitri R., Student perceptions of laboratory classroom activities and experimental physics practice
Dreyfus, Benjamin W, How the Learning Assistant Experience Impacts Learning Assistants as Students
Dreyfus, Benjamin W, Longitudinal impact of flipped and traditional introductory physics courses
Eblen-Zayas, Melissa, Supporting student quantitative skills across introductory STEM courses: faculty approaches and perceived needs
Euler, Elias, The digital technologies of physics education research
Fairfield, Jessamyn, Bright Club: Using Stand-up Comedy for Informal Education
Fields, Melanie, The transition to online teaching during the COVID-19 pandemic at a regional, rural university: The experience of learning assistants
Fischer, Christopher, Changing pedagogy to help traditionally under-served populations
Flowers, Abigail, Development of computational thinking skills in an introductory physics lab.
Fox, Michael, Capturing modeling pathways using the Modeling Assessment for Physics Laboratory Experiments
Franklin, Maxwell, Physics education research’s implicit views of physics faculty
Franklin, Scott, Who Goes where: patterns in academic field switching of successful college graduates
Frazer, Laszlo, “It’s Fundamental”: Quantum Dot Blinking Experiment to Teach Critical Thinking
Fung, Anderson T., Ordinary differential equations in physics: some preliminary observations of the role of rote procedure
Gavrin, Andrew D., Physics students’ reactions to an abrupt shift in instruction during the COVID-19 pandemic
Gifford, Julian D., A framework for curriculum design to support mathematical sense making
Giordano, Nicholas, Developing Augmented Reality Modules to Teach Electromagnetism
Goodhew, Lisa, A case of resources-oriented instruction in calculus-based introductory physics
Gray, Nickolas, What do Students Know about Electromagnetic Wave Generation?
Guthrie, Matthew, A tale of two guessing strategies: interpreting the time students spend solving problems through online log data
Gutmann, Brianne, “I’m not that important”: Barriers and bolsters to student agency during conversations about the intersections of physics and ethics
Hamdan, Alia, Contributing Effects to Students’ Performance on the FCI as a Measure of Physics Knowledge
Hamdan, Alia, Lightning changes amidst Covid-19: A case study of how a large research institute moved physics classes and labs online and its impact on students and
Head, Thomas, Believe that they can achieve: How Teacher Attitudes Toward Physics Impact Student Outcomes
Henderson, Rachel, Implementing a mixed-methods approach to understand students’ self-efficacy: A pilot study
Her, Pachi, Examining student understanding of matrix algebra and eigentheory
Hertel, Matthew E., A graduate teaching assistant’s approach to building a supportive learning community for introductory physics students.
Hoehn, Jessica R., Investigating students’ views about the role of writing in physics lab classes
Holmes, Natasha, Preliminary evidence for available roles in mixed-gender and all-women lab groups
House, Lindsay, Legacy of the Pale Blue Dot: Can introductory astronomy experiences impact mindset and self-efficacy?
Huffman, James, Investigating Upper-Division Students’ Interpretations of the Divergence Theorem
Hull, Michael M, Respecting fluidity of student ideas: student-centered and enjoyable lessons about radioactivity
Ibrahim, Bashirah, Students’ visual gaze in solving sequential and simultaneous synthesis problems
Ives, Joss, Exploratory Factor Analysis of a survey on group-exam experiences and subsequent investigation of the role of group familiarity
Izadi, Dena, *Physics Communication through Art: Development of Intersecting Identities*

Jambuge, Amali Priyanka, *Assessment feedback: A tool to promote scientific practices in upper-division*

Jeon, Sophia, *How do gender and in chargeness interact to affect equity in lab group interactions?*

Jia, Ying, *Improving student understanding of a rigid body rolling without slipping*

Johnson, Brandon James, *A Case Study Exploring Reasons a Hard-Working Student Might Copy from Yahoo Answers*

Johnson, Nekeisha, *Examining consistency of student errors in vector operations using module analysis*

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Leak, Anne E., *The influence of teacher questioning approaches on students’ productive thinking*

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Li, Yangquting, *How learning environment predicts male and female students’ physics motivational beliefs in introductory physics courses*

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Liu, Raylor, *Modeling the Complexity of Change and Implications of Sensemaking*

Lo, William, *Insights into student understanding of statistical mechanics*

Logan, Savannah L., *College faculty support for grade 7-12 teaching careers: survey results and comparisons to student perceptions*

Malespina, Alysa, *The additional benefit of working in same-gender groups on students’ self-efficacy in introductory physics*

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Marshman, Emily, *Improving student understanding of Dirac notation by using analogical reasoning in the context of a three-dimensional vector space*

Martin, Makenna M., *A tool for documenting and analyzing the flow of conversation about teaching and learning in facilitated faculty conversations*

Mason, Andrew J., *Attitudes and approaches towards physics problem solving: by life science major, by course sequence, and by shutdown status*

May, Jason M., *Students’ dynamic engagement with experimental data in a physics laboratory setting*

Mays, Mikayla, *Examining and supporting student construction of alternative lines of reasoning*

McCaulley, Austin, *Understanding LA sensemaking: using “teacher hat” to prompt changes in discussion frame*

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McInerney, Alistair, *Investigating a collaborative group exam as an instructional tool to address student reasoning difficulties that remain even after instruction*

McQuade, Alexa, *Characteristics of institutions with Learning Assistant programs: An equity investigation*

Mellen, Jillian, *Qualitative analysis of student perceptions of their self-efficacy*

Mikota, Matthew, *Workplace Climate for LGBT+ Physicists: Predictor of Outness*

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Mondesir, Raphael, *Toward characterizing the demographics of introductory physics courses*

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Morrison, Andrew, *Comparison of student-reported study habits with faculty expectations and predictions*

Moshfeghyeganeh, Saeed, *The Effect of Spirituality and Religiousness on Students’ Physics Career Choice in the US*

Mullen, Claire, *A Community of Practice Approach to Identity Formation*

Mullen, Claire, *Computation for Science: Engaging university science students in computational thinking*

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Myers, Carissa, *Student perspective about the impacts of feedback*

Nadeau, Michael, *Participation in an online community of high school physics teachers*

Okwei, Eugene, *Understanding the Impact of Large-Scale Radio Astronomy Projects on Student Engagement With Physics in Ghana*

Oliver, Kristin, *Examining effective mentorship in undergraduate research experiences at a large research institution*

Olsho, Alexis, *Online administration of a reasoning inventory in development*

Ota, Shuya, *New measurements of BEMA performance based on the classical test theory*

Owens, Lindsay M., *Physics GRE Requirements Create Uneven Playing Field for Graduate Applicants*

Patterson, Zac, *Students’ pre-instructional perspectives of quantum physics*

Pawlak, Alanna, *Improving education through departmental change: a comparison of approaches*

Pearson III, Richard L., *Results of faculty interviews during the development of the Perceptions of Teaching as a Profession in Higher Education (PTaP.HE) instrument*

Pollard, Benjamin, *MAPLE, the Modeling Assessment for Physics Laboratory Experiments*

Prefontaine, Brean, *Informal Physics Programs as Integral Experiences for Physics Identity Development*

Pugh, Samantha, *Developing Business Acumen and Employability in Physics Undergraduates: What do students really learn?*

Quaal, Adam, *Exploratory factor analysis of the QMCA*

Quichocho, Xandria R., *Understanding physics identity development through the identity performances of Black, Indigenous, and women of color and LGBTQ+ women in physics*

Rainey, Katherine D., *Developing coupled, multiple-response assessment items addressing scientific practices*

Rak, Gwendolyn, *Exploring the Durability of Student Attitudes Toward Interdisciplinarity*

Ramey II, Charles L., *Comparative analysis of letters and reports in an upper-division lab*

Ramírez Díaz, Mario Humberto, *Analysis of the evolution and results of Physics Teacher Professional Development projects for Preschool*


Riihiluoma, William, *Student Use of Dirac Notation to Express Probability Concepts in Quantum Mechanics*

Rios, Laura, *Analysis of students perceptions of classroom structure, belongingness, and motivation in an introductory physics course*

Rodelli, Liana, *Analyzing the impacts of a new mobile application on student understanding of and attitudes toward electric fields*

Rodríguez, Miguel, *The associations between conceptual learning, physics identity and social interdependence*

Rosauer, Jeffrey Robert, *Thematic analysis of student manipulations of the PhET simulation “Fluid Pressure and Flow”*

Rosenblatt, Rebecca, *Investigating partnerships and funding for the Physics Education Research community*

Rubien, Jack D., *The impact of IPLS in a senior biology capstone course*
Ryan, Qing, *Question Characteristics and Students' Epistemic Framing*

Sagear, Sheila, *Student learning outcomes with hybrid computer simulations and hands-on labs*

Salehi, Shima, *Implicit and unchecked assumptions interfere with problem-solving in physics*

Salmani, Fatema Al, *A Rubric for Assessing Thinking Skills in Free-Response Exam Problems*

Sammons, Amber, *Changes in student attitudes and curricular benefits as a new course activity becomes standard*

Sarriugarte, Paulo, *Students' understanding of the moment of inertia in a rotating rigid body*

Sayer, Ryan, *Advanced students’ and faculty members’ reasoning about the double slit experiment with single particles*

Scanlon, Erin M., *Practicing physicists’ knowledge about disability: Development of the Disability and Physics Careers Survey (DPCS)*

Scherr, Rachel E., *Centering and marginalization in introductory university physics courses*

Shafer, Devyn, *When the Gatekeeper Says No: Mechanics Students’ Resilience and Success*

Singh, Chandralekha, *Why equivalent structural equation models of physics identity have different instructional implications*

Sirnoorkar, Amogh, *Qualitative Analysis of Students’ Epistemic Framing Surrounding Instructor’s Interaction*

Smith, Emily M., *“Let’s just pretend”: Students' shifts in frames during a content-reinforcement lab*

Smith, Trevor, *Toward a valid instrument for measuring physics quantitative literacy*

Stang, Jared, *Exploring the contributions of self-efficacy and test anxiety to gender differences in assessments*

Stanley, Bryan, *Perspectives on informal programs: How site visits can help us learn more*

Starita, Jason T., *What makes a person a physicist? Learning Assistant and physics major views*

Stewart, John, *What does the Force and Motion Conceptual Evaluation pretest measure?*

Strubbe, Linda E., *PhysPort as professional development to foster creativity in teaching*

Stump, Emily M., *Student reasoning about sources of experimental measurement uncertainty in quantum versus classical mechanics*

Sulaiman, Nidhal, *Impact on students' views of experimental physics from a large introductory physics lab course*

Sundstrom, Meagan, *Problematizing in inquiry-based labs: how students respond to unexpected results*

Thacker, Beth, *Development of an Instrument to Measure Student Assistants’ PCK-Q*

Tipton, Maya, *Does IPLS help students apply physics to biology?*

Topdemir, Zeynep, *Students’ integration related to recognition*

Traxler, Adrienne, *Chili and mistakes: Students reflect on research*

Trucks, Jesica L., *Extending Learning Beyond the Planetarium with the Dome+ Model*

Ungermann, Matthias, *Do Hessian high schools foster understanding of Nature of Science?*

Van Dusen, Ben, *A critical examination of DFW rates in LA supported physics courses*

Vignal, Michael, *Comparing Unprompted and Prompted Student-Generated Diagrams*

Walsh, Cole, *Connecting the dots: Student social networks in introductory physics labs*

Walterm, Paul J., *Comparing item response curves of matched pre-/post-FCI respondents*

Wang, Jianlan, *Scrutinize SA-student interaction in inquiry-oriented college physics courses*

Waterson, Alyssa C., *Analyzing time-to-degree for transfer students at a Large Midwestern University*

Weidner, Carrie A., *Investigating student use of a flexible tool for simulating and visualizing quantum mechanics*

Weller, Daniel P., *Video Analysis of Variation in Computational Thinking Practices in Physics*

Werth, Alexandra, *Process of transforming of an introductory mechanics lab course at Fort Lewis College*

Whitcomb, Kyle, *Recognition always matters: A cross-sectional study of the physics identity of physics majors*

White, Courtney, *Student evaluation of more or better experimental data in classical and quantum mechanics*

Wilcox, Bethany, *Understanding the student experience with emergency remote teaching*

Williams, Stephanie M., *Living Physics Portal: Designing analytics to map faculty’s evolving participation*
Wilson, Michael B., *E&M Plane Wave Visualization Designed for Improved Student Understanding*
Winther-Larsen, Sebastian Gregorius, *Quantifying professors’ effect on student grades*
Wood, Laura A. H., *Transfer Student’s Narrative of Groupwork Characterized by Research Methods Course*
Young, Nicholas T., *The Physics GRE does not help “overlooked” applicants*
Young, Tamara, *A case of successful learning about magnetism through the use of evidence*
Zhang, Muxin, *Examining the Social Dynamics of Small-Group Discussions*
Zich, Raymond, *Changes to equipotential diagrams to improve student ranking of electric potential*
Zimmerman, Charlotte, *Exploring student facility with "goes like" reasoning in introductory physics*
Zwartz, Michael, *Examining student growth in laboratory notebook practices in introductory physics courses*

**Custom Format Abstracts**

Barthelemy, Ramón, *What was, is and will be Physics Education Research*
Fracchilla, Claudia, *Expanding your network: IPER Community buildathon*
Henderson, Rachel, *Diverse Career Paths in Physics Education: A Panel Discussion*

**Juried Talk Abstracts**

Alicea-Muñoz, Emily, *Transforming the Preparation of Physics GTAs*
Cardinot, Adriana, *Game-based learning as a tool for promoting conceptual change in astronomy*
Felker, Zachary, *The impact of extra credit incentives on students’ work habits when completing online homework assignments*
Gjerde, Vegard, *Providing learning opportunities based on cognitive psychology and PER: student adoption, attitudes, and results in introductory mechanics*
Hamerski, Paul C., *A Formative Feedback Mechanism Shaped by Learning Assistants*
Hechter, Richard, *Painted yellow lines: Exploring parameters of physics teacher self-efficacy in a new teaching landscape*
Langbeheim, Elon, *Constructing particle-level models to promote macro-level conceptualization of electric circuits in middle school*
Mellen, Jillian, *Qualitative analysis of students’ perceptions of their self-efficacy in a flipped integral calculus course*
Rosen, Drew J., *Epistemological, socialization, and help seeking views in traditional and at-home undergraduate physics laboratories*
Van Dusen, Ben, *Associations Between Learning Assistants, passing introductory physics, and equity: a QuantCrit Investigation*
Vignal, Michael, *Investigating Similarities and Differences across Unprompted and Prompted Student-generated Diagrams*
Wan, Tong, *Evaluating impact of GTA training in a mixed-reality classroom simulator*

**Symposium Poster Abstracts**

Lindell, Rebecca, *Proposed Development Methodology for the Fluid Conceptual Evaluation (FCE)*
Meredith, Dawn, *Scaffolding student mechanistic reasoning about static and dynamic liquids*
Rosenblatt, Rebecca, *Visual Attention and Affordance Lenses for: Understanding Student Diagram Use and Designing Improved Instruction of Fluid Dynamics in a Physics for Li*

**Symposium Talk Abstracts**

Adams, Wendy K., *Faculty perceive they are more supportive than their perceptions may suggest...*
Bergeron, Paul, *Holistic Teaching Evaluations and Knowledge in Use*
Bertschinger, Edmund, *Educational Change from an Administrator's Perspective*
Bertschinger, Edmund, *Systemic Change: TEAM-UP and Beyond*
Brahmia, Suzanne White, *A conceptual blend analysis of student reasoning about Physics Quantitative Literacy Reasoning Inventory (PIQL) items*
Canright, Jared, *Design and student experience of novel physics systems delivered in virtual reality labs*
Doucette, Danny, *Making lab TA professional development work (and some evidence that it does)*
Dounas-Frazer, Dimitri R., *Taxonomy of teaching practices during group projects in lab courses*
Eynde, Sofie van den, *Dynamic conceptual blending analysis to model student reasoning processes while integrating mathematics and physics*
Gavrin, Andrew D., *Introducing Computational Physics Across the Curriculum*
Greenwald, Scott, *Vignettes on VR Learning Applications: 2D vs. 3D, and "Aha!" Moments in Collaborative Learning*
Henderson, Charles, *Assessment of teaching effectiveness: Lack of alignment between instructors, institutions, and research recommendations*
Hirsch, Andrew S., *Departmental Change Through Instructional Reform: How Purdue Transitioned to Matter & Interactions*
Isola, Drew, *Data mining: Helping faculty develop an accurate picture of the teaching profession in their region*
Kozminski, Joseph F., *Skill Development in Physics Labs Beyond the First Year*
Langley, Dorothy, *Training teachers as physics research mentors: four personal development stories*
Levy, Smadar, *Re-defining lab norms via professional learning communities of physics teachers*
Logan, Savannah L., *Research-based, User-tested Materials for Recruiting STEM Teachers*
Maries, Alexandru, *Using formative assessment to improve the teaching effectiveness of teaching assistants*
Marsh, L. Trenton S., *Re)imagining Success Through Photovoice At a High-Achieving Urban Charter School*
McCologan, Michele, *Team-based Learning in Upper-Level Physics Courses: A Qualitative Case Study*
Nolte, David D., *Modernizing Upper-Division Mechanics: Preparing Students for a Complex World*
Porter, Chris, *Using Virtual Reality in Electrostatics Instruction: The Impact of Training*
Pyper, Brian, *Survey development and analysis for Getting the Facts Out*
Quan, Gina M., *Students' exploring and refining their equity ethic within the Access Network*
Rosenblatt, Rebecca, *Promoting Institution Change: PER and Policy Working Together*
Rosengrant, David, *Teaching Force and Motion in Augmented Reality*
Rutberg, Joshua, *Professional development and struggles of beginning instructors teaching design labs*
Schermerhorn, Benjamin P., *Modeling the construction and interpretation of equations: Incorporating symbolic forms into a conceptual blend*
Zamarripa Roman, Brian, *Explicating the goal contents of Latinx female physics students*

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