

# Collaborating between Writing and STEM: Teaching Disciplinary Genres, Researching Curricular Interventions, and Engaging Science Audiences

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## Phase I: Need for Curricular Intervention

- Physics faculty observe that students lack writing skills, particularly with genres of writing in their field of study
- Writing taught sporadically in undergraduate curriculum
- Faculty training typically does not prepare to teach writing
- Curriculum must prepare students for variety of careers
- Report by Joint Task Force on Undergraduate Physics Programs → revise the curriculum with emphasis on communication

## Curricular Collaboration: Physics and Writing Faculty

- Introduce concepts from Writing Studies to Physics faculty
- Demonstrate that students can be taught writing conventions of physics, and that faculty can do this teaching
- Collaborate on development and dissemination of physics-specific curricular materials
- Research how teaching physics genres enables students to conceptualize themselves as emerging scientists

## Phase II: Physics and Writing Research

- **Interdisciplinary study** between Physics Department and University Writing Program, in parallel with curricular revision
- **Research question:** Does instruction in genre and understanding audience improve undergraduate writing in physics?

Identify key genres of physics writing

Collect student writing in these genres

Develop rubrics to code and evaluate writing

Perform quantitative and qualitative analysis

- **Longitudinal study:** collect student writing from courses spanning the sophomore, junior, and senior year
- **Comparative study:** collect student writing from before and after the introduction of explicit writing genre instruction

## Phase III: STEM and Writing Faculty Collaboration

- Expanding from Physics to STEM with monthly seminar series between STEM and Writing Faculty
- Share research from Writing Studies and STEM
- Exchange pedagogical interventions related to writing
- Develop in- and external community of research and practice

## Professional Organizations and Funding Agencies

- American Physical Society funds for curriculum development
- University funding to create data and build research team
- National Science Foundation grant applications to further develop research study in physics

## Future Writing and STEM Collaborations

- Further expand the community by disseminating findings to STEM faculty and Writing Studies scholars
- Continuation and broadening of student writing assessments throughout the STEM curriculum
- Future grant applications by Writing and STEM faculty together

## New Physics Learning Goals

Familiarity with physics genres

Proficiency in communicating ideas & research

Capacity to communicate with various audiences

Active participation in peer review

Analysis & reporting on articles & proposals

Applications for competitive opportunities & jobs

## Curricular Interventions: Genres in Physics (Written materials for research study in boldface)

**Abstract** Physics Today Article  
Oral summary without slides

**Summary** Research Article  
Oral summary with slides

**Abstract** Research Project  
Presentation with slides

**Cover letter & Resume** Careers & Applications  
Elevator pitch

**Abstract for research** Proposal  
Presentation for outreach

Presentation on research ethics and issues of equity

**Lab research reports**

**Poster on lab project**

**Final report on research**

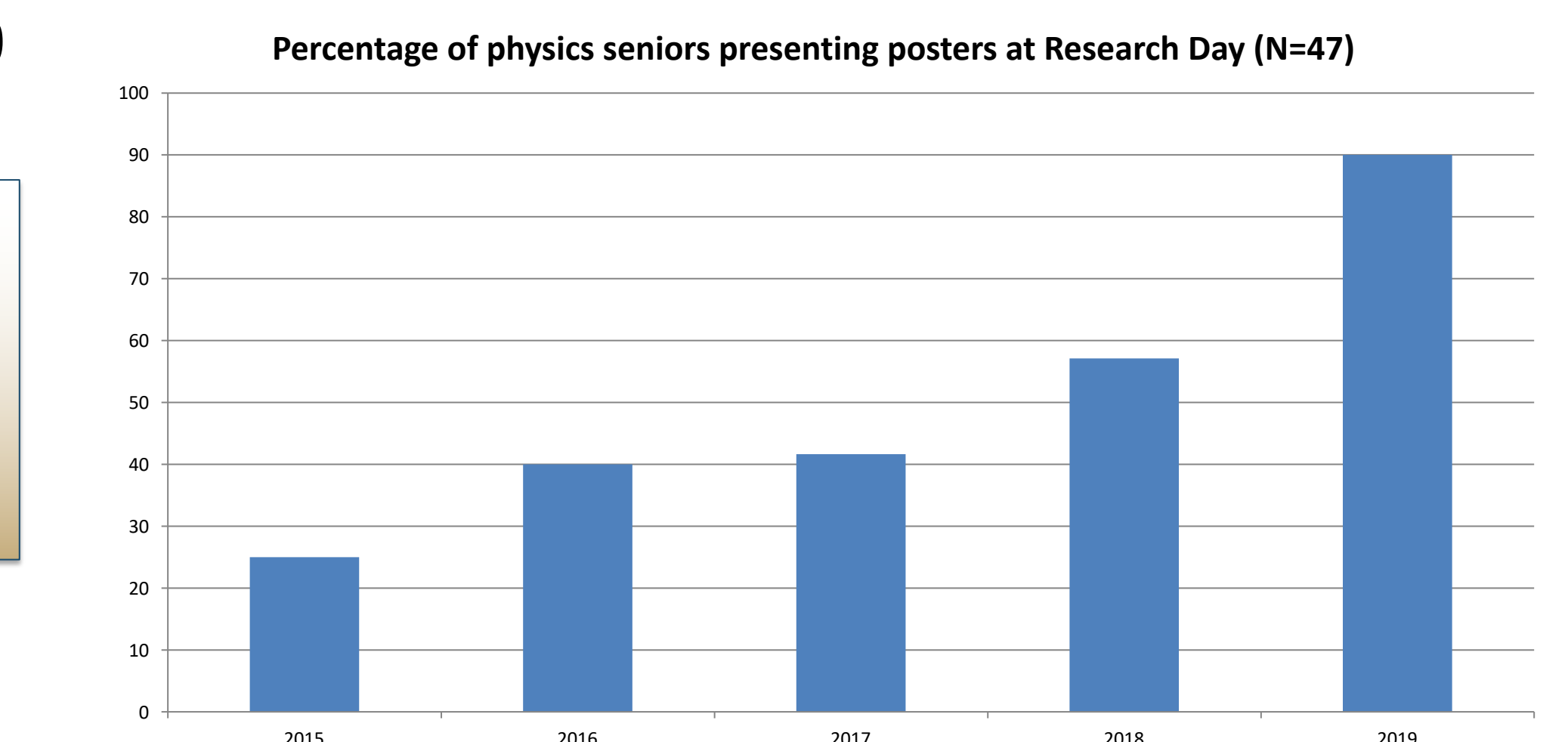
Symposium Presentation

**Poster at Research Days**

## Current Research Status

- Collected student writing from all relevant courses
- Developed rubrics and training packets for coders
- Evaluated and rated all abstracts, posters and graphs from 2017 to 2019

Increased student engagement



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## Citations

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