



1-2019

Supporting an Introductory EM Lab Redesign with the E-CLASS and AAPT Lab Guidelines

Helen Mae Cothrel

Ronald Tackett

Gregory N. Hassold

Follow this and additional works at: https://digitalcommons.kettering.edu/physics_conference



Part of the [Physics Commons](#)

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/330290178>

Supporting an Introductory EM Lab Redesign with the E-CLASS and AAPT Lab Guidelines

Poster · January 2019

DOI: 10.13140/RG.2.2.36762.90562

CITATIONS

0

READS

15

3 authors, including:



Helen Mae Cothrel
Kettering University

7 PUBLICATIONS 0 CITATIONS

[SEE PROFILE](#)



Ronald Tackett
Kettering University

47 PUBLICATIONS 639 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



Expectations and Experiences in a Modern Physics Laboratory Course [View project](#)



Photolithography for the Investigation of Nanostructures [View project](#)

Supporting an Introductory EM Lab Redesign with the E-CLASS and AAPT Lab Guidelines

PHYSICS EDUCATION



Helen Mae Cothrel*, Ronald J. Tackett†, Gregory N. Hassold‡
 Department of Physics, Kettering University
 *PER Specialist †Presenter @rjtackett ‡Team Chair




Resources

The AAPT Undergraduate Lab Curriculum Focus Areas from the AAPT Recommendations for the Undergraduate Laboratory Curriculum

1. Constructing Knowledge
2. Modeling
3. Designing Experiments
4. Developing Technical and Practical Lab Skills
5. Analyzing and Visualizing Data
6. Communicating Physics

Context

Features of the university and the lab course

Private, Non-PhD Granting institution	STEM and Business Students	Primarily Considered an Engineering School
		
	Two 11-Week Academic Terms per Year	Two 11-Week Co-Op Terms per Year

New Course Objectives

During this laboratory course, successful students will:

- Ask and answer scientific questions through experimental design and implementation.
- Develop technical and practical laboratory skills.
- Generate, analyze, and interpret data.
- Incorporate uncertainty in measured values, calculated values, and graphical representations.
- Write effective technical reports which includes
 - Articulating the reasoning that connects theoretical models to laboratory activities
 - Using appropriate style and voice

The Colorado Learning Attitudes about Science Survey for Experimental Physics (E-CLASS)

Paired Questions

Pre and Post

Post only

1. Students' personal attitudes and beliefs	2. Students' view of experts
Course Statement: (e.g., Whenever I use a new measurement tool, I try to understand its performance limitations.)	
3. Does this practice help to earn a good grade? <i>Figure adapted from the E-CLASS website (CU Boulder)</i>	

Actionable Evidence for Instructor

Current Lab

Nine weekly labs with a lab exam/practical.

Lab notebook suggested, but not required.

Proposed Change

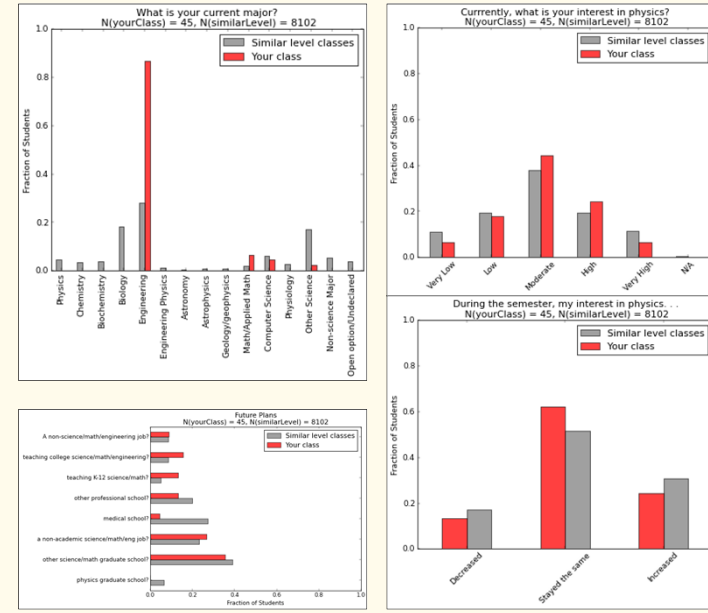
Four one-week training activities.

Three challenge labs (each two weeks).

Lab notebook required

E-CLASS results

For one quarter (Fall 2018) of the original lab course



Pre-Post results point to room for improvement (Not all 30 questions included here)

