

# Transition to online labs at ECU

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# Transition to online labs at ECU

- 1 Labs before Coronavirus
- 2 Spring 2020: Adapt! (Don't change)
- 3 Fall 2020 (and beyond?)



# ECU's Lab transformation grant – XLABs (Awarded 2017)

## Team Members

### Physics:

- Co-PI: Steven Wolf
- Mark Sprague

### Chemistry:

- Project Lead: Joi Walker
- Rosa Bell
- Kate Hosbein
- Annalisa Smith-Joyner
- Eric Eaton

### Biology:

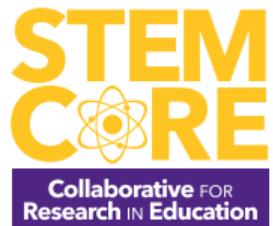
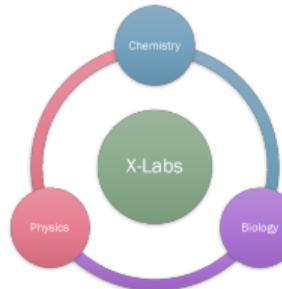
- Co-PI: Heather Vance-Chalcraft
- Co-PI: Kristine Callis-Duehl
- Taria Crenshaw

## Project page:

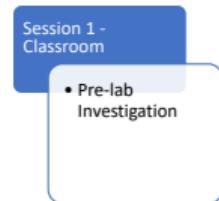
<http://blog.ecu.edu/sites/xlabs/>



Award # 1725655



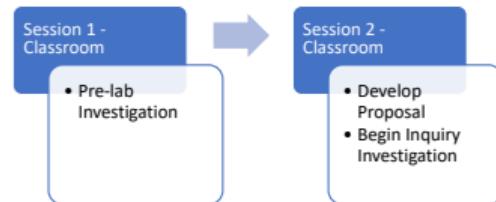
## ADI Investigation Cycle



Studying science practice transfer between disciplines

# Physics labs at ECU in BC days

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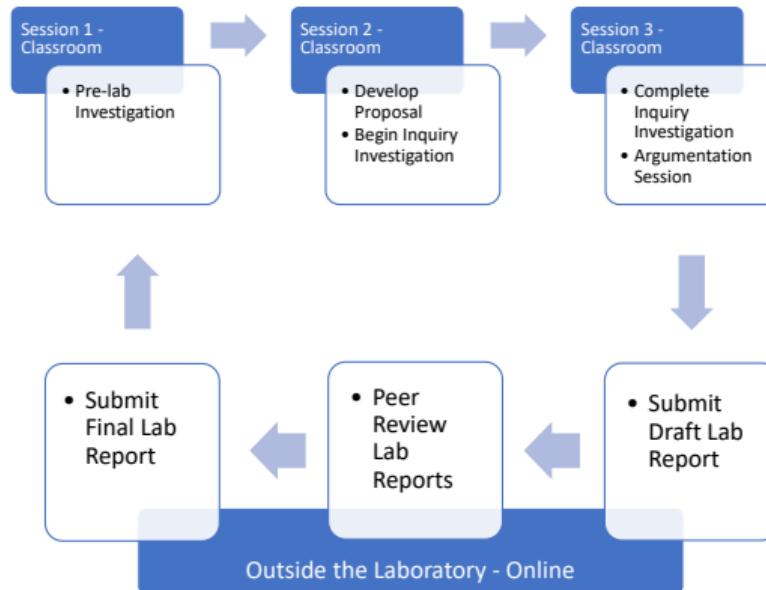


Studying science practice transfer between disciplines



# Physics labs at ECU in BC days

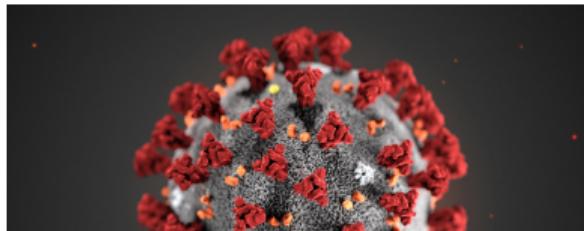
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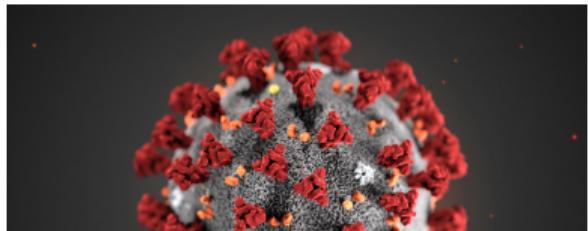
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- Preserve ADI format for last two investigations
- How can we change our delivery while maintaining our focus on science practices?



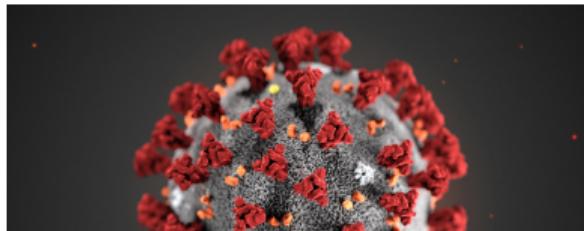
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  - ① Proposal approval
  - ② Argumentation session



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  - ① Proposal approval
  - ② Argumentation session
- What can we do apart? (What do we want students to solve on their own?)
  - ① Data collection (Both Prelab and Inquiry Investigation)
  - ② Data analysis
  - ③ Peer review/lab report revision



# Delivering Data



Image of diffraction pattern for student measurement.

- Measurements online using photos and video
- Simulations on Trinket



# Challenges with online labs

## Technology-based

Used university-supported solutions or open-source software

- Microsoft Office (Excel)
- Tracker
- ImageJ

Required students to install on their own machines.

- ECU Center for Survey research identified access to computers as an issue for a significant fraction of our students. (Nearly 2000)
- Not all computers are created equal. (Chromebooks were a problem)



## Curriculum-based

Argumentation sessions got quiet

- Participation in argumentation was more muted
- Fewer questions, less sharing ideas



# Fall 2020 plans (and beyond)?

Goal: We still wanted a hands on experience.

Adaptations for fully online labs:

- Lab manuals were made available online
- Students purchased kits for a reasonable price
- Activities/questions slightly changed

Post pandemic: We have DE students who struggle to take lab courses.

Adaptations to challenges

- Students are made aware of computing requirements/work-arounds
- Argumentation sessions became a participation grade

# Fall 2020 plans (and beyond)

## New challenge: 8 week blocks

- We dropped an investigation
- We added some pre-labs

This helped with grading.



# Tools used in online lab delivery

Tool	Use	Rationale
Canvas	Material, Assignments, Quizzes, Discussions, Online Peer Review	University LMS
WebEx	Class introduction, argumentation, group interactions (???)	University supported
Glowscript.org	Simulations embedded in Canvas	Fine-grained control
ImageJ	Image processing software	Open-source
Tracker	Video processing software	Open-source