



2021 Virtual HBCU-UP/CREST PI-PD Meeting



**NC Central**  
UNIVERSITY



**HBCU-UP TIP: Engaging Undergraduates in STEM through Drosophila Behavioral Genetics (**EUSTEM-DaBuGs**)**

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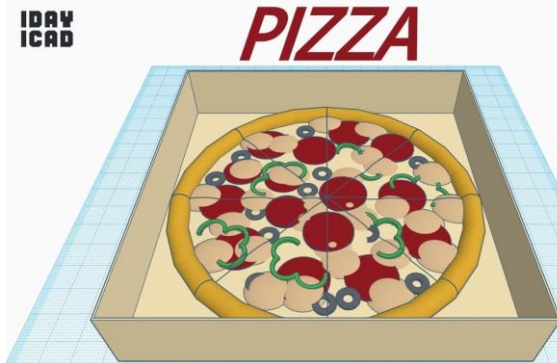
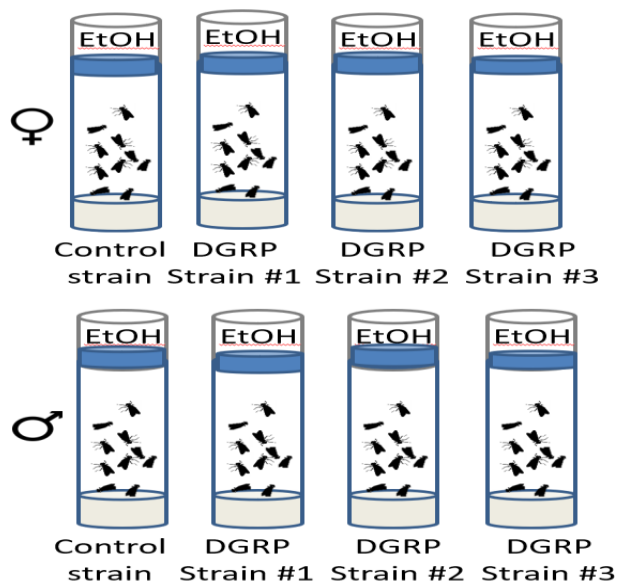
**# 1912188**

All findings and opinions are those of the authors, not necessarily of the funding agency or AAAS.

# Project Overview

Infuse 2 courses and create interdisciplinary Summer Internship with Behavioral Genetics and Engineering Design to increase retention, graduation and matriculation to graduate school rates among underrepresented minority students at NCCU.

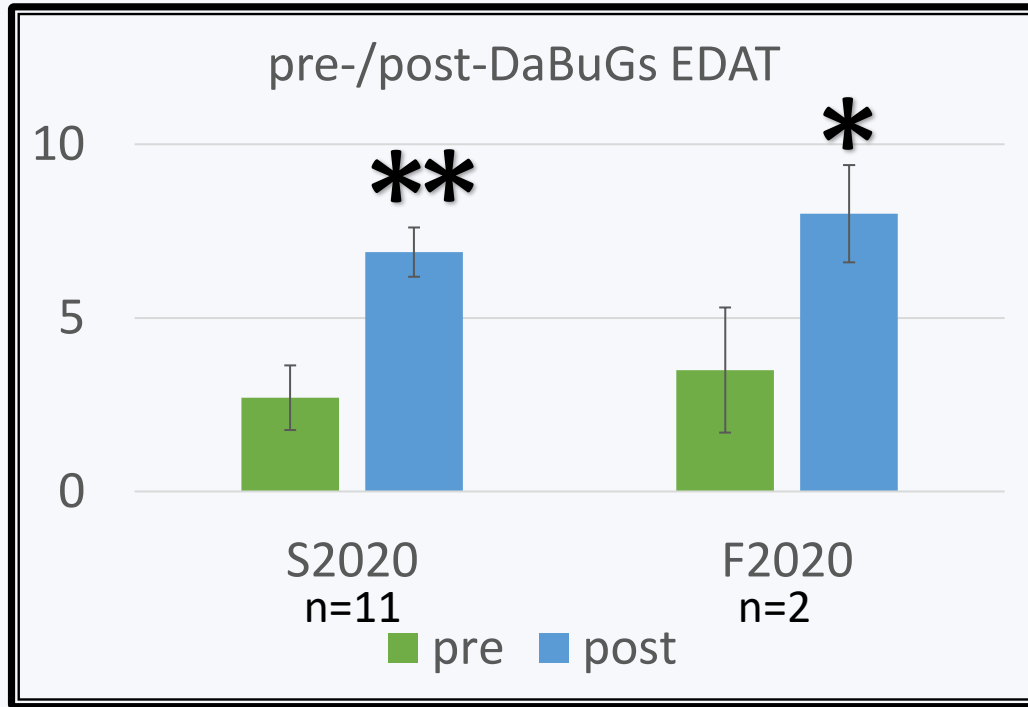
## 1. Ethanol Mobility Behavior Assays 2. TinkerCAD



## 3. 3D Printing



# Best Practices/Successes



\*\*\* P=0.0001

\* P=0.04

**Results**

EMBA AVG ST100

Average ST100 (Mins.)

Drosophila Strain and Gender

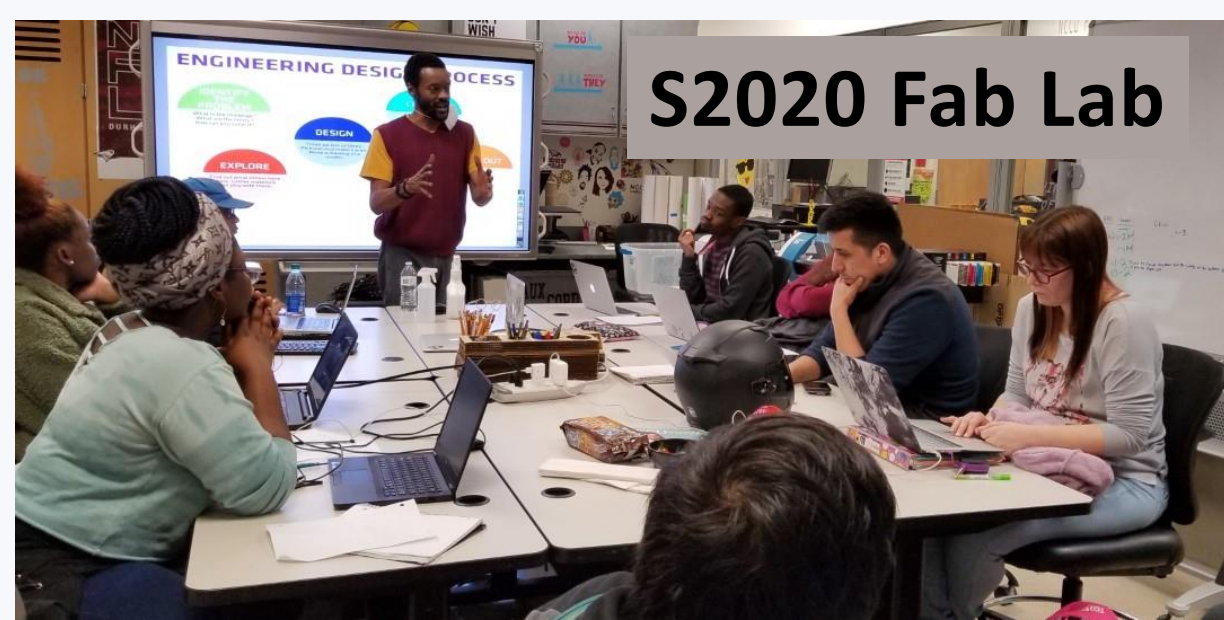
Figure 4: Graph of the data collected from the ethanol mobility behavior assays. ST100 shows how many minutes it took for flies of each strain to become sedated.

Figure 5 : A model of the design created using the 3D software Tinkercad.

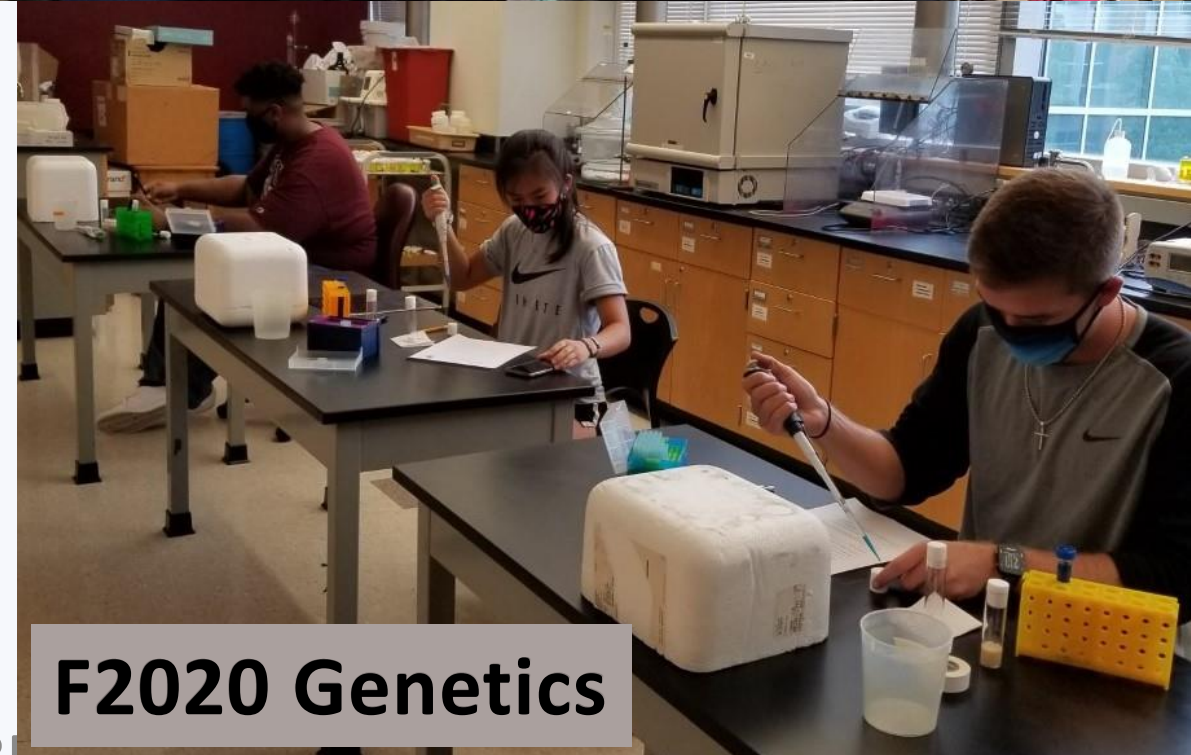
Figure 6 : A 3D print of the vial holder to test for efficiency.

# Covid-19 Implications: decreased #s

- **BIOL2030 DaBuGs – run twice - HYBRID**
  - 11 Fab Lab TinkerCAD designs
  - 10 DGRP strains EMBA
  - **13 students impacted (20 was aim)**
- **Summer Internship – run once – NO CONTACT**
  - 1 motorized design with prototype motor
  - 8 DGRP strains EMBA
  - **2 students impacted (on target)**
- **BIOL3100 Genetics – run once - HYBRID**
  - 14 Fab Lab molecular designs
  - Two EMBA assays, Flybase, and 1 Fetal Alcohol Syndrome assay
  - **14 more students impacted (30 was aim)**



S2020 Fab Lab

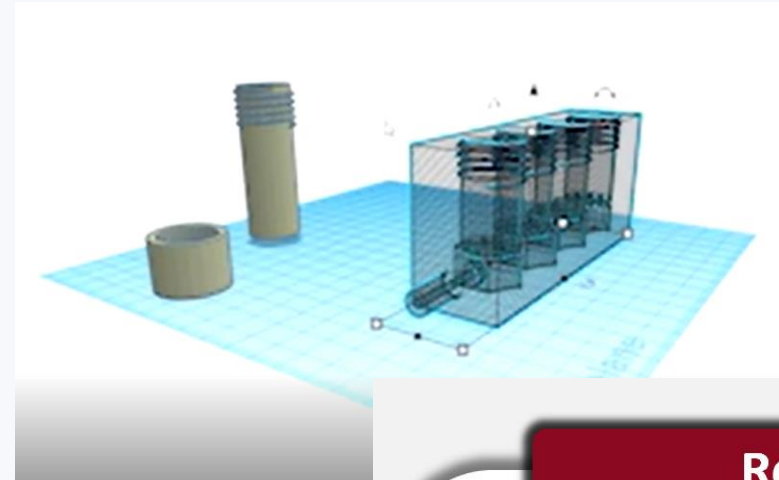


F2020 Genetics

# Identified Gap(s) for Future Collaboration or Enhancement

## Gaps & Enhancements

- Fall & Spring 2020 Students want
  - **more time with mentors**
  - **and more hands-on experience.**
- **LOVE** the DaBuGs video lectures!!!
  - Need more for Fab Lab
- Connections to Research 1 Institutions Translation Science Centers **needs establishment**
- **More** electrical engineering opportunities.



## Results

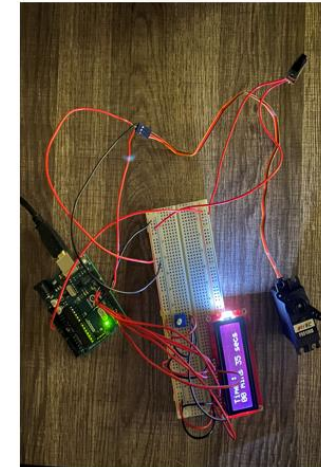


Figure 7: The coded and operational circuit.

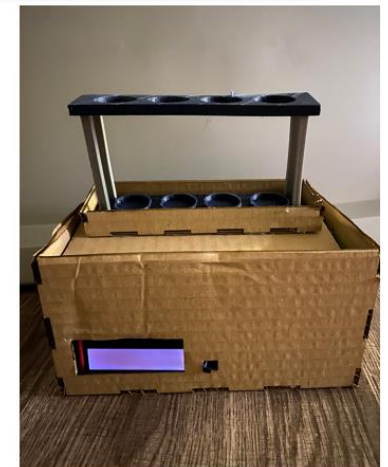


Figure 8: The 3D print used to test measurements and placement of wires.