INVESTIGATING LABS
FINDING QUALITY IN FORENSICS & CHEMISTRY

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CREDENTIALING

- Ph.D. in Chemistry, focus area of Biochemistry
- Research in Chemical Education
- Adjunct at UF 2004-2005
- Assistant Professor at Penn State Berks 2005 – 2012
- Associate Professor 2012 – present
Hey, you should advise in forensics!

And we need someone to teach an introductory forensics course!

Oh, and a 200 level course too!
ISO/IEC 17020 ACCREDITATION

‘Interned’ at Berks County Forensic Services Unit (FSU) in 2016

ASQ CMQ/OE

‘Volunteer’ Quality Manager
# HENRY SYSTEM OF FINGERPRINT CLASSIFICATION

- Whorls get values depending on finger

<table>
<thead>
<tr>
<th>#</th>
<th>Finger</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>R Thumb</td>
<td>16</td>
</tr>
<tr>
<td>2</td>
<td>R Index</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>R Middle</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>R Ring</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>R Pinky</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>L Thumb</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>L Index</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>L Middle</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>L Ring</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>L Pinky</td>
<td>1</td>
</tr>
</tbody>
</table>

\[
\text{sum of even fingers} + 1 \\
\text{sum of odd fingers} + 1
\]
SO THIS BRINGS US TO ONLINE LABS

Building renovation led to implementing online labs

How do students fare?

Actual labs, not just data analysis
Lab 1 Online vs Traditional Course Grades

PRELIMINARY ANALYSES
Lab 1 Online vs Traditional Attempts and Withdrawals

ATTEMPTS AND WITHDRAWALS
All Online vs All Traditional Course Grades

high only

ALL ONLINE
All Online vs All Traditional Attempts and Withdrawals

ONLINE VS TRADITIONAL
Online/Trad vs Trad/Trad
Attempts and Withdrawals

ALL LABS
CONCLUSIONS

Students grades are not statistically different between lab types

Students tend to withdraw less and thus need fewer attempts at concurrent courses if they are or have been in an online lab

But these are active labs, not just data analysis!
This research study has been approved by the Pennsylvania State University Internal Review Board Study 00008039