How did the different structures in our traditional and inquiry labs affect students' use of: (1) the equipment, (2) the provided desktop computer, (3) their own laptop or personal device, (4) paper, worksheets or notebooks, or (5) other.

In labs that fostered collaborative group work and promoted decision making, there was a task division along gender lines with respect to laptop and equipment usage.

No such task division existed in labs with little collaboration.

143 Students
Introductory Calculus-Based Physics Course

32 Women
Dark Markers

109 Men
Light Markers

0 Other

2 Undisclosed

Students self-select a lab section (without knowing differences)

Traditional Labs
Reinforce concepts
Specific instructions
Individual worksheets

Inquiry Labs
Experimentation process
Extensive decision making
Group e-Notebooks.

k-means clustering on the observed, quantified behaviors of students in labs. Optimal number of clusters was found using the elbow method.

Average Squared Distance

Cluster Composition

Computer
Other
Paper

143 Students
Across 30 Lab Periods

Every 5 minutes, an observer documented what every student in the lab was doing.

Generate student profiles, normalized distributions representing fraction of codes for each student.

Example
Student 1: Codes

<table>
<thead>
<tr>
<th>Minute</th>
<th>Equipment</th>
<th>Other</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

Example
Student 1: Profile (Distribution)

Turn each profile into Z-Scores (Mean=0, SD=0)

32 Women
Dark Markers

109 Men
Light Markers

0 Other

2 Undisclosed

Quantified Behavior
522 Student Profiles

Questions?
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