Interactivity online and on-campus: Data Analysis and Statistical Inference
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GOAL
Design learning materials for a variety of delivery methods (online, on-campus, hybrid), collect and analyze data to evaluate their effectiveness, and enhance the materials with lessons learned from these analyses.

Online

**Task:** Emulate the brick-and-mortar classroom experience of learning R (a statistical programming language) where the instructor can help the student in real time.

**Solution:** DataCamp (web-based interactive platform for learning R) as an alternative to static instructions, fully integrated to the Coursera course via the LTI protocol.

**Data:** Click-thru data on viewing hints and solutions as well as performance and time taken to complete labs.

**[Some] findings:** Valuable information on lab components that students most struggle with, data that would be very difficult to effectively collect or glean in brick-and-mortar lab setting.

**Implementation:** Attention, Relevance, Confidence, Satisfaction (ARCS) model earlier in video design + Although most students are intrinsically motivated, external rewards seem to have an effect on motivation.

**Analysis:** Preliminary observations: In-video questions for attention, on-screen test questions on at-risk students, provide accessible materials in many formats, etc.

**Results:** Pre-post scores on Comprehensive Assessment of Outcomes in a First Statistics course (CAOS) test.

**Next steps:** Part of university-wide study on learning and attitude of students in flipped courses, analysis and results forthcoming.

On-campus

**Task:** Increase interactivity in the brick-and-mortar classroom by flipping the course, and do no harm (to learning and attitude) while doing so.

**Solution:** Use materials developed for Coursera as out-of-class learning materials to prepare students for in-depth hands-on exercises completed in teams in class.

**Data:** Students’ perceptions of flip-lecture effectiveness, and enhance the materials with lessons learned from these analyses.

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Other projects

**Identifying characteristics that predict student persistence**
by Anthony Weishampel, StatSci

**Understanding the mooc student experience through text analysis of interviews** by Heather Shapiro, StatSci & Clara Lee, Chemistry

**Engagement, self-regulated learning, and perceptions of motivational strategies**
by Kun Li, CIT

**Social anxiety and forum posting behavior**
by Maria Elena Carvajal, Chemistry

**Pre-post scores on Comprehensive Assessment of Outcomes in a First Statistics course (CAOS) test**

<table>
<thead>
<tr>
<th>Post</th>
<th>Mean</th>
<th>SD</th>
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<tbody>
<tr>
<td>Pre-flip</td>
<td>14.71</td>
<td>12.13</td>
</tr>
<tr>
<td>Flip w/ readings</td>
<td>16.56</td>
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</tr>
<tr>
<td>Flip w/ videos</td>
<td>18.49</td>
<td>13.34</td>
</tr>
</tbody>
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