Assessing Student Learning
Using a Digital Grading Platform

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Teaching Tips from AAEA Winners
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Student Learning Objectives

What should students learn in this course?

- Articulate skills and dispositions – not course content
- Identify measurable behaviors/outcomes – not broad platitudes
- Share early and often with students

Examples:
By the end of this course, students should be able to...

- apply mathematical and graphical techniques to determine how prices are set in a market
- qualitatively interpret quantitative/analytic results
- articulate the benefits and limits of the economic models covered in class for addressing real-world policy questions
Assessment Techniques

- **OK**: end-of-term student surveys
  - Pros: low time commitment, easily manageable quantity of data
  - Cons: biased self-assessments, lack of baseline, student fatigue

- **Good**: regular student feedback
  - Pros: student-specific comparisons possible, feedback “normalized”
  - Cons: biased self-assessments, student fatigue, more instructor work

- **Better**: dedicated instructor analysis
  - Pros: objective analysis of student learning, instructor focused on SLOs
  - Cons: (potentially) massive instructor time commitment, requires fine-tuning

- **Best**: integrated assessment
  - Pros: students provide assessment data while completing assignments or exams, instructors focused on SLOs throughout the term
  - Cons: planning required, (potentially) time-consuming
Example of Integrated Assessment

- (new) Introductory Data Science course at UC Berkeley
- 400+ students
- Team of instructors and teaching assistants with one primary instructor
- 12 student learning objectives focused on computer science and statistics skills
- Online grading tool: gradescope.com
“Tagging” assignment questions with SLOs

2: Investigating Poverty

2.1: Histogram of incomes for households
   - CODE
   - GRAPHS
   1 point

2.2: Histogram of number of people per household
   - CODE
   - GRAPHS
   2 points

2.3: The ahs_poverty table
   - CODE
   2 points

2.4: The poverty_counts table
   - CODE
   1 point

2.5: Bar chart of poverty rates
   - CODE
   - CALCULATE
   - GRAPHS
   1 point

2.6: Evidence that poverty is related to / caused by location
   - INFERENCE
   - APPROPRIATE
   2 points
### Table: Assignments 1-4 (First Half of Semester)

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>Assignment 1</th>
<th>Assignment 2</th>
<th>Assignment 3</th>
<th>Assignment 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Points</td>
<td>% Correct</td>
<td>Points</td>
<td>% Correct</td>
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<tr>
<td>Write programs</td>
<td>8</td>
<td>87</td>
<td>15</td>
<td>89</td>
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<tr>
<td>Extend a program</td>
<td>8</td>
<td>87</td>
<td>7</td>
<td>92</td>
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<tr>
<td>Calculate statistics</td>
<td>2</td>
<td>96</td>
<td>14</td>
<td>89</td>
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<td>Identify sources of randomness</td>
<td>6</td>
<td>87</td>
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<td>Form a null hypothesis</td>
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<td>Statistically test a hypothesis</td>
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<td>Form correct conclusions</td>
<td>11</td>
<td>84</td>
<td>–</td>
<td>–</td>
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<td>Identify appropriate analyses</td>
<td>9</td>
<td>84</td>
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<td>Note benefits/limits of computing</td>
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<tr>
<td>Generate graphs</td>
<td>2</td>
<td>83</td>
<td>–</td>
<td>–</td>
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<tr>
<td>Make predictions</td>
<td>–</td>
<td>–</td>
<td>2</td>
<td>78</td>
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<tr>
<td>Assess prediction accuracy</td>
<td>–</td>
<td>–</td>
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</table>
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Try gradescope.com for free as an instructor:
Invite code: AAEA2016