Can students evaluate their own understanding?

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Mazur Group
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Motivation

We thought...
Clear lectures: good
Confusion: bad

But,
Interactive teaching methods = more ?‘s
“to wonder is to begin to understand”
Methods

Use the following scale to rate your comprehension of the concept of ________.

1 - I am totally lost (I really have no clue at all)
2 - I am pretty confused -- many things don't make sense to me
3 - Some aspects confuse me, but it's beginning to make sense
4 - I understand it mostly, but I still have some questions
5 - I think I have a solid grasp of the concept
Methods

- Students rate their understanding throughout the learning process.
  - Pre-class reading
  - Lecture
  - Tutorial
  - Homework
  - Exams

- Compare rating with understanding.
Methods: Correlation

- Indicates strength and direction of a linear relationship

![Graph showing correlation between beers drank and grade with r = -0.74](www.uwsp.edu/psych/stat/7/correlat.htm)
Methods: Correlation

- Indicates strength and direction of a linear relationship

http://noppa5.pc.helsinki.fi/koe/corr/cor7.html
Methods: Correlation

- Indicates strength and direction of a linear relationship
Methods: Correlation

- Indicates strength and direction of a linear relationship

$\rho = 0.5$
Methods: Correlation

- Indicates strength and direction of a linear relationship
Methods: Correlation

- Indicates strength and direction of a linear relationship
Results

Average student confidence

<table>
<thead>
<tr>
<th>Stage in learning process</th>
<th>Confidence</th>
</tr>
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<tbody>
<tr>
<td>RA 1</td>
<td>3.05</td>
</tr>
<tr>
<td>Lect 1</td>
<td>3.24</td>
</tr>
<tr>
<td>RA 2</td>
<td>2.71</td>
</tr>
<tr>
<td>Lect 2</td>
<td>3.29</td>
</tr>
<tr>
<td>PSet</td>
<td>3.32</td>
</tr>
<tr>
<td>Exam 1</td>
<td>3.55</td>
</tr>
<tr>
<td>Exam 2</td>
<td>3.53</td>
</tr>
<tr>
<td>Exam 3</td>
<td>3.47</td>
</tr>
<tr>
<td>Final</td>
<td>3.67</td>
</tr>
</tbody>
</table>
Results

Correlation of student ratings with their performance

- Third exam: $r=0.46$
- Second exam: $r=0.34$
- First exam: $r=0.26$
- Lecture: $r=0.25$
- Reading assignment: $r=0.15$
- Final exam: $r=0.29$
Conclusion

Students are not good at evaluating their own understanding,

BUT, they get better with greater knowledge and more feedback!
Thank you

Mercedes Lorenzo
Jessica Rosenberg
Martin Vogt
Eric Mazur

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Results

Average student confidence by gender

Stage in learning process

Male
Female

Confidence

RA 1  |  Lect 1  |  RA 2  |  Lect 2  |  PSet  |  Exam 2  |  Exam 3  |  Final
Results

Correlation of student ratings with their performance by gender

- Female
- Male

Stage in learning process:
- Reading assignment
- Lecture
- Second exam
- Third exam
- Final exam