FACTORS THAT MAKE PEER INSTRUCTION WORK: A 700-USER SURVEY

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AAPT Winter Meeting
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Outline

- Background
- Peer Instruction demographics
- What makes it work
- Challenges
Background: Peer Instruction

- Students read before class
Background: Peer Instruction

- Students read before class
- Lectures interspersed with ConcepTests
Background: Peer Instruction

- Students read before class
- Lectures interspersed with ConceptTests
- Students think about and discuss ConceptTests
PI implementation survey

Web-based, over 700 responses

- personal information
- course information
- background on PI
- implementation
- grading/assignments
- results
- evaluation
- community
Demographics

Discipline of surveyed PI users:

- Physics: 82%
- Chemistry: 4%
- Life sciences: 4%
- Engineering: 3%
- Astronomy: 2%
- Mathematics: 2%
- Other/blank: 3%
### Demographics

**Institution types of surveyed PI users:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>University</td>
<td>67%</td>
</tr>
<tr>
<td>4-yr college</td>
<td>19%</td>
</tr>
<tr>
<td>High school</td>
<td>5%</td>
</tr>
<tr>
<td>2-yr college</td>
<td>3%</td>
</tr>
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<td>Comm. college</td>
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![Pie chart showing the distribution of institution types](image)
Does it work?

YES!

PI successful for almost all respondents!
Does it work?

Plan to use PI again:
- definitely: 80%
- maybe: 5%
- with changes: 6%
- probably: 8%
- NO: 2%
- definitely: 80%
Does it work?

Plan to use PI again:
- definitely: 80%
- yes: 88%
- probably: 8%
- maybe: 5%
- with changes: 6%
- NO: 2%

332 (88% of PI users) is likely to use PI again
Does it work?

Plan to use PI again:

- definitely: 80%
- probably: 8%
- with changes: 6%
- maybe: 5%
- NO: 2%

332 (88% of PI users) is likely to use PI again.

27% of these use a standard assessment instrument.
### What makes it work?

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<th></th>
<th>use again</th>
<th>others</th>
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<td>reading assignments</td>
<td>55%</td>
<td>49%</td>
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<tr>
<td>non-competitive grading</td>
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surprisingly little effect!
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<th>Others</th>
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<tr>
<td>entire term</td>
<td>81%</td>
<td>65%</td>
</tr>
<tr>
<td>stopped midway</td>
<td>4%</td>
<td>10%</td>
</tr>
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<tr>
<td>positive</td>
<td>75%</td>
<td>38%</td>
</tr>
<tr>
<td>positive, not at first</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>positive, only at first</td>
<td>0%</td>
<td>7%</td>
</tr>
<tr>
<td>mixed response</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
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**consistency and student response important!**
Challenges

Common challenges mentioned and solved

- Politics
- Student resistance
- Student participation
- Coverage of material
- Preparation time
“my colleagues don’t think that students should be discussing anything during class”
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“data showed they did as well or better than the other section’s students on identical exams”
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“data showed they did as well or better than the other section’s students on identical exams”

collect data!
“you are paid to teach, not to ask me questions!”
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“students took to it quite well, but it required careful explanation of the purposes of the ConcepTests”
“you are paid to teach, not to ask me questions!”

“students took to it quite well, but it required careful explanation of the purposes of the ConcepTests”

motivate method to students!
some students were too cool, too alienated, or perhaps too lost to participate
Student participation

“some students were too cool, too alienated, or perhaps too lost to participate”

“start it off from the first day so that students expect it every class period”

“conceptual questions on exams help”

“if I circulated in the class and stopped here and there with a question, the noise level came up quickly — some of it surely just to keep the teacher away”
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be consistent, involved, and test appropriately
“I felt under a time crunch — so much to cover according to the course catalogue”
Coverage of material

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“I pointed out early on that I can’t provide all the information required in two short lectures per week, so reading is required to do well in the course”

"cutting down on quantity of material is desirable”
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“cutting down on quantity of material is desirable”

assign reading or reduce breadth
“the first time to use PI, the effort was enormous — four or more hours of preparation time for each class period”
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could not do it without materials others have written”

“without the Peer Instruction book, it would have taken about 30% more time, but with it about 30% less”
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resources ARE available
Project Galileo

http://galileo.harvard.edu
Peer Instruction works

Successful in a wide variety of settings

Existing resources help implementation
Funding: National Science Foundation

For a copy of this talk and additional information:

http://mazur-www.harvard.edu