

Engaging Students One-on-One, All At Once Session 2

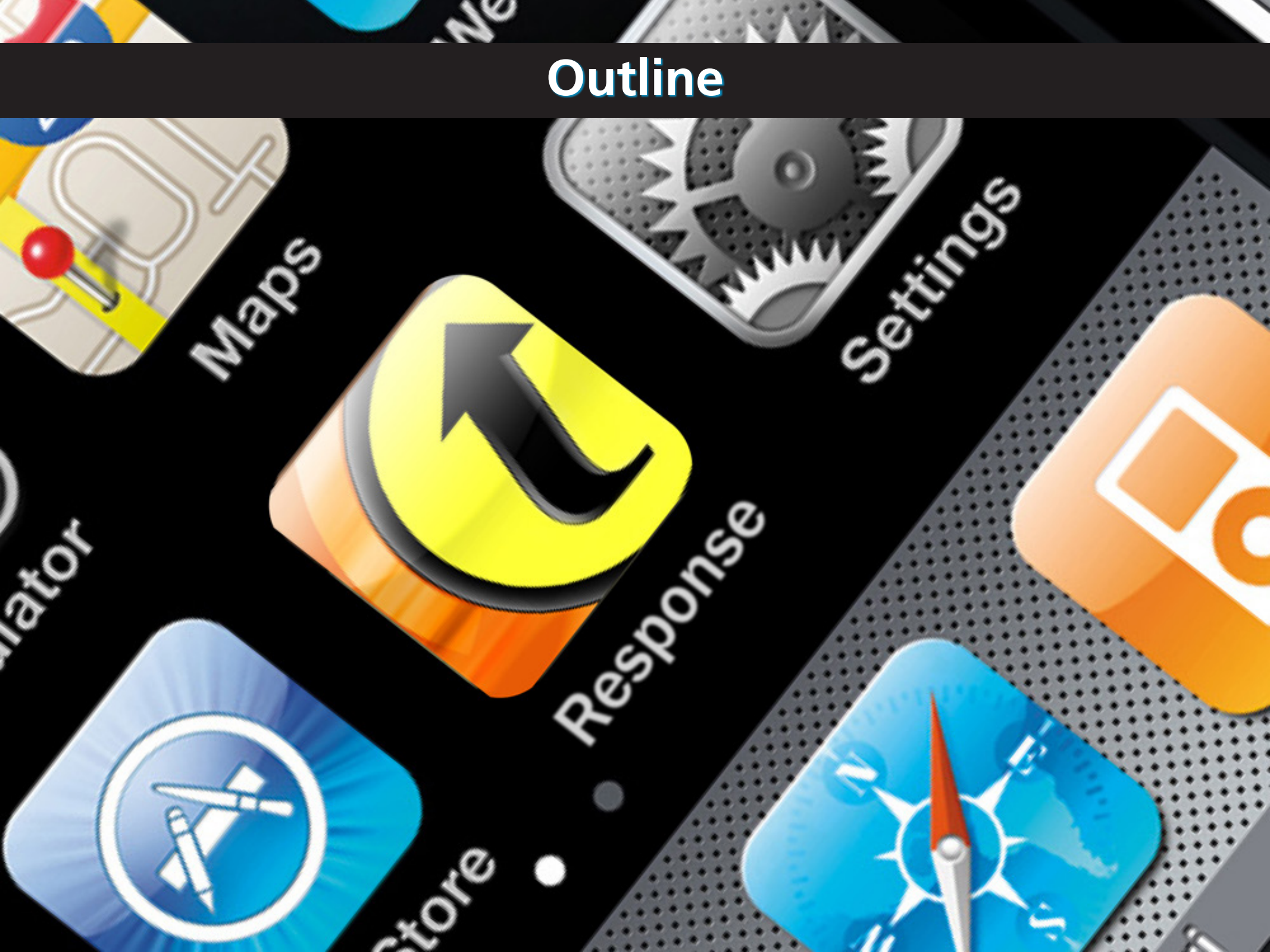


Peer Instruction Online Course
Singapore Polytechnic
3 December 2014

Session 2 slides

<http://mazur.harvard.edu>

Outline



Outline

- **Your questions**
- **Developing PI/JiTT questions**
- **Strategies for assessment**

Online Polling

1. Go to learningcatalytics.com/demo
2. Enter info, click "Start"
3. Join session 123456789

Your questions

“What are the common problems faced by ‘newbies’ when they embark on PI and how did they tackle them?”

Your questions

Question categories:

- **Creating/finding ConcepTests**
- **Moving information transfer out of classroom**
- **Administering ConcepTests**
- **Student resistance**
- **Assessment**

Your questions

Question categories:

- **Creating/finding ConcepTests (part 2)**
- **Moving information transfer out of classroom**
- **Administering ConcepTests**
- **Student resistance**
- **Assessment (part 3)**

Your questions

Question categories:

- Creating/finding ConcepTests (part 2)
- **Moving information transfer out of classroom**
- Administering ConcepTests
- Student resistance
- Assessment (part 3)

Moving information out of classroom

“Must students always complete a pre-class reading?”

Moving information out of classroom

*“How to make students read before class
if they are not used to it?”*

Moving information out of classroom

My approach:

- **do not deliver information in class**
- **offer a reward**
- **use reading feedback as opportunity to help**

Moving information out of classroom

“Are students supposed to get first exposure to content and complete an assessment of their content understanding before coming to class?”

“Is there a recommended time frame to get students to read up outside of class before the actual Peer Instruction?”

Moving information out of classroom

My approach:

- **Reading quizzes (1991)**
- **Reading summaries (1994)**
- **Just-in-Time Teaching (1999)**

Your questions

Question categories:

- Creating/finding ConcepTests (part 2)
- Moving information transfer out of classroom
- **Administering ConcepTests**
- Student resistance
- Assessment (part 3)

Administering ConceptTests

“Students’ understanding might be diverse. How can we ensure that the lessons are pitched at the right level?”

Administering ConceptTests

“What are the possible problems we can run into when we conduct the class using PI for a large group of students (around 80–100 participants)?”

Administering ConceptTests

“Do we need clickers?”

How can we apply PI, without any ICT tools for polling?”

Administering ConceptTests

Yes! (And the learning gains are the same)

- **show hands (on chest)**
- **flash cards**

Administering ConcepTests

“How many ConcepTests or number of questions are appropriate for a 45-minute lesson?”

Administering ConceptTests

*“Is there any preferred structure of effective ConceptTest,
e.g., are MCQ preferred to short questions?”*

Administering ConceptTests

“How can PI be implemented in courses that focuses on teaching skills instead of concepts?”

For example, I teach students how to write an essay but not the content that goes into the essay per se.”

Administering ConceptTests

“How do you get really quiet students to be more involved and not feel even more intimidated by the discussions?”

Administering ConceptTests

"I tried using it on my students last week. I had difficulty getting them to move around to look for people with different answers."

Your questions

Question categories:

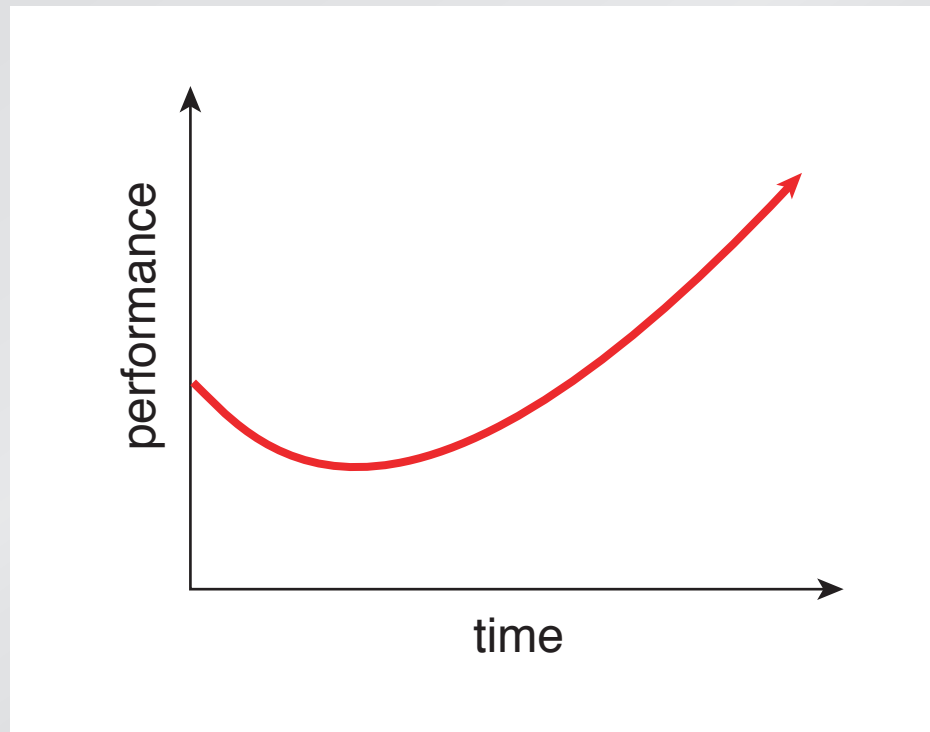
- Creating/finding ConcepTests (part 2)
- Moving information transfer out of classroom
- Administering ConcepTests
- **Student resistance**
- Assessment (part 3)

Student resistance

“How can I engage my students in reacting positively to Concept Tests?”

Student resistance

After changing, things might get *worse* before they get better!



Student resistance

Written on Wednesday Feb 16, two weeks into the course:

Subject: concerns

Professor Mazur,

Here are a few concerns. I speak for many of my classmates.

1) You are giving us WAY to much work. After spending multiple hours on the problem set, and not being able to figure out many of the questions, I now see that we have an additional 6 or 7 pages or homework in the workbook. I just spent 4 hours on the lab, and I am not confident on almost half of the questions. This is more work than I have had all semester in all of my other classes combined.

2) If you are going to give us this much work, I would suggest re-structuring the lectures. I find the readings very difficult to understand. I am not a bad student (I got a solid A in physics 1a), but it is very difficult to internalize the readings. You should spend most of the lecture going over, point by point, the readings in their entirety. While the PRS clickers are fun, they do not help me understand the complex material.

I am extremely flustered by the incredibly large amount of work, and my inability to understand it, and I am strongly considering dropping the course.

Student resistance

Written on Monday May 23, just after the final exam:

Subject: Thanks!

Professor Mazur,

First of all I want to thank you for a great semester. You are an excellent professor, and it is clear that you truly care about each and every student.

The exam went well today. I'm not sure to what extent you will curve the final grades (if at all), but it looks like I may be right around the cutoff point between an A and an A-. I studied as hard as I could and I'm keeping my fingers crossed about the A, but no matter what happens with my grade you should know that you are one of the best professors that I have ever had at Harvard.

Thanks again!

Student resistance

Hello Prof. Mayer,
I wanted to hand you this card as
a token of my deep appreciation of
how you have helped me throughout
the semester. You are truly
an inspiring and have
changed how I look at
"learning". I also wanted
to thank you for
how understanding
you were of all
my circumstances.
You really made a difference
in my life. So THANKS
Thank you!



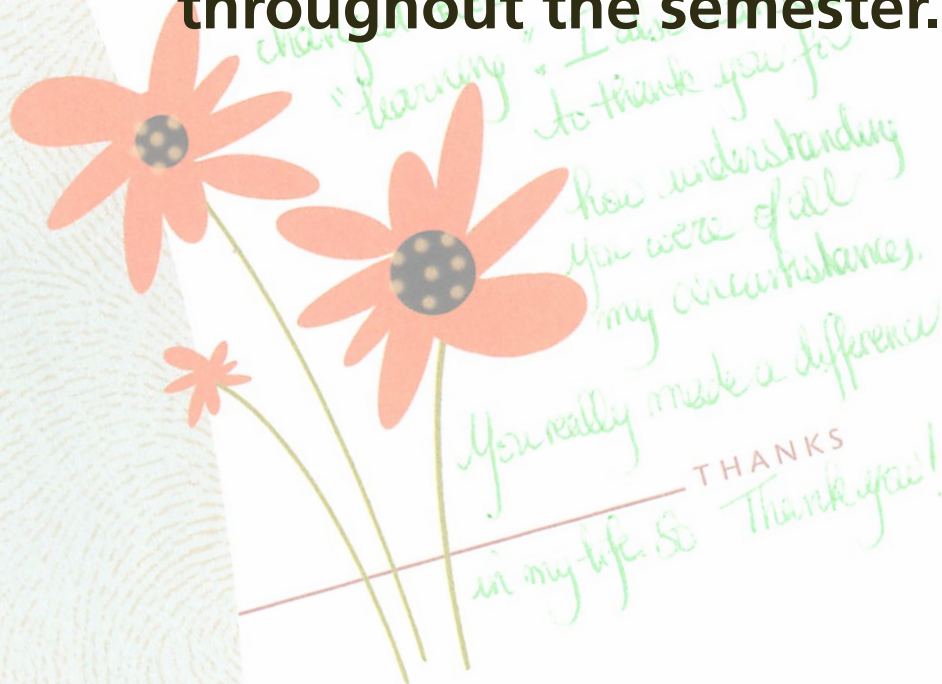
You made a difference.

Love, Best

Student resistance

"I wanted to hand you this card as a token of my deep appreciation of how you have helped me throughout the semester."

You made a difference.



Student resistance

"I wanted to hand you this card as a token of my deep appreciation of how you have helped me throughout the semester. You are truly awe inspiring and have changed how I look at "learning".

You made a difference.

*You really made a difference
in my life. So THANKS
Thank you!*

Best

Student resistance

"I wanted to hand you this card as a token of my deep appreciation of how you have helped me throughout the semester. You are truly awe inspiring and have changed how I look at "learning". [....] You really made a difference in my life."

You made a difference.

*THANKS
in my life. So Thank you!*

Best

Student resistance

and don't forget...

Student resistance

and don't forget...

PI leads to better learning and retention!

Student resistance

*“Is it advisable to award class participation marks
for student discussion during PI?”*

Resistance

“How do we promote this to colleagues who may not be very keen to try something new/different?”

Outline

- **Your questions**
- **Developing PI/JiTT questions**
- **Strategies for assessment**

Developing PI/JiTT questions

“How is ConcepTest question different from the questions that is meant for JiTT, i.e., posed before lesson and for review before teaching?”

Developing PI/JiTT questions

“How to use ConcepTests if the module contents and learning outcomes are mostly procedural?”

Developing PI/JiTT questions

Your ranking of the CTs on the assignment (best to worst):

3, 5, 1, 6, 4, 2

Our ranking of the CTs on the assignment (best to worst):

5, 3, 4, 1, 6, 2

Developing PI/JiTT questions

Your ranking of the CTs on the assignment (best to worst):

3, 5, 1, 6, 4, 2

Our ranking of the CTs on the assignment (best to worst):

5, 3, 4, 1, 6, 2

Developing PI/JiTT questions

Which of the following is the Pythagorean theorem?

a) $a + b = c$

b) $a^2 + b^2 = c^2$

c) $a^2 + b^2/c^2$

d) $y = mx + b$

Developing PI/JiTT questions

Your ranking of the CTs on the assignment (best to worst):

3, 5, 1, 6, 4, 2

Our ranking of the CTs on the assignment (best to worst):

5, 3, 4, 1, 6, 2

Developing PI/JiTT questions

Ana plays goalie for a soccer team competing in the FIFA world cup. Her coach asks her to warm up by running from one corner of the field to the exact middle of the field. About how far does she need to run?

Developing PI/JiTT questions

<http://bit.ly/CTfeedbackF14>

Developing PI/JiTT questions

In humans, after meiosis I, there are two cells.

How many total chromosomes are present in each cell in the metaphase of meiosis II?

- A. 2
- B. 23
- C. 46
- D. 92

Developing PI/JiTT questions

Which configuration of shift register circuit has many data inputs and 1 data output?

- A. parallel-in, parallel-out shift register**
- B. parallel-in, serial-out shift register**
- C. serial-in, parallel-out shift register**
- D. serial-in, serial-out shift register**

Developing PI/JiTT questions

“How do I select which concepts to evaluate?”

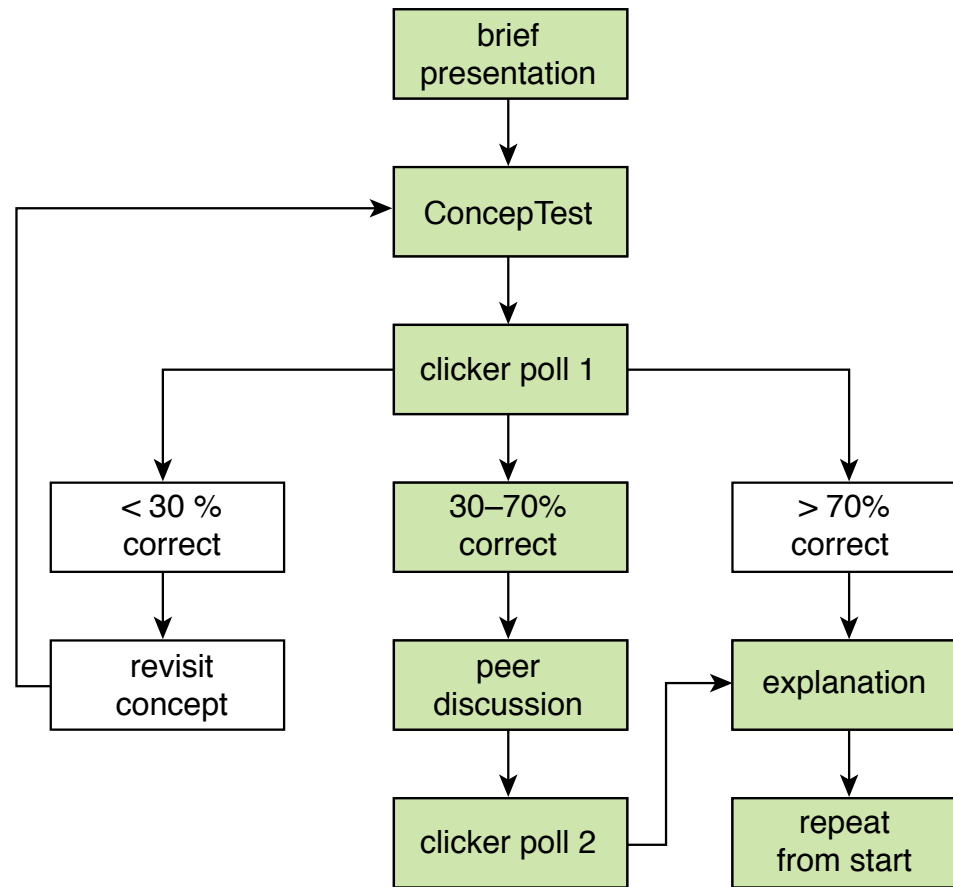
Developing PI/JiTT questions

“What if slow learners are not learning enough as a foundation to progress to the next topic? Would Peer Instruction method still work on them?”

Developing PI/JiTT questions

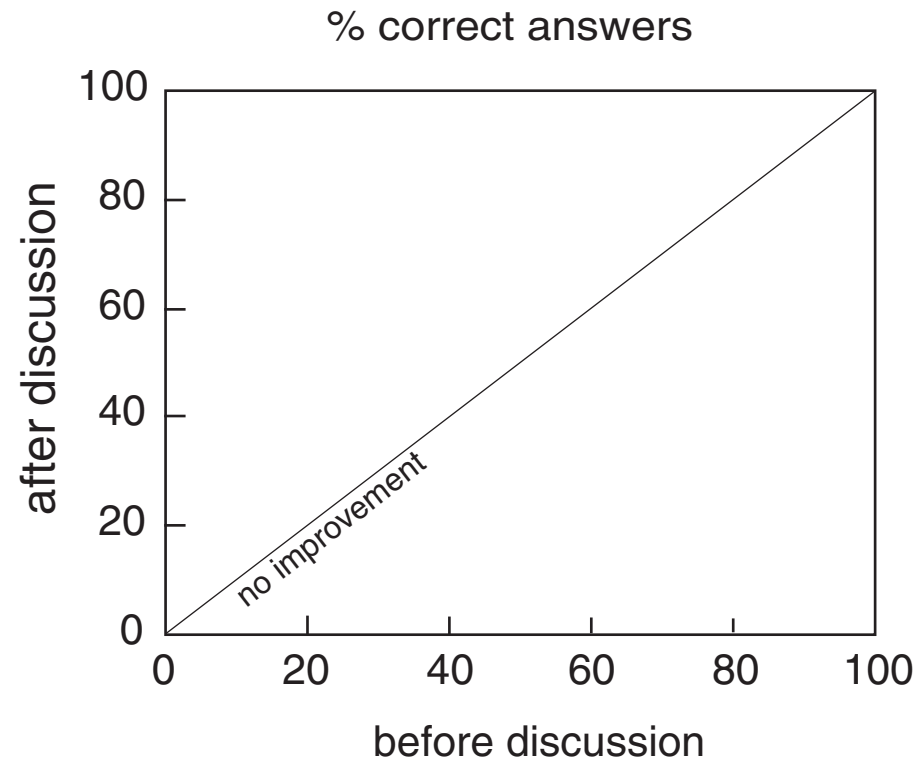
“How do I evaluate the effectiveness of ConcepTests where there is no right answer and hence we do not have to help students to arrive at the right answer — one way of evaluating if a ConcepTest is useful is to compare the number of students choosing the right answer pre-peer discussion and post-peer discussion.”

Developing PI/JiTT questions



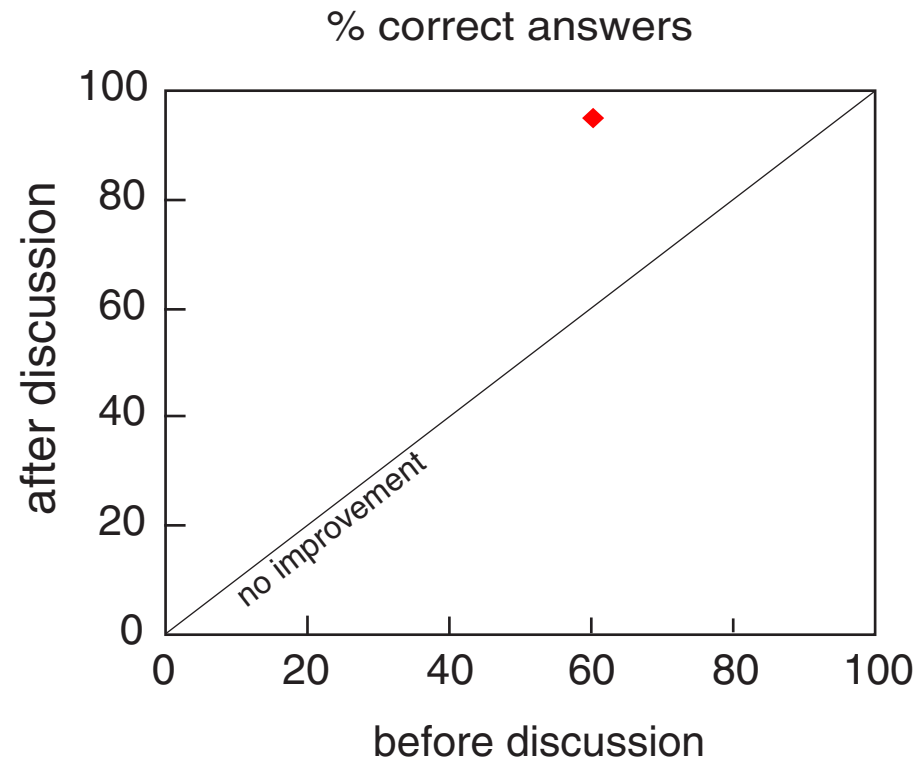
Developing PI/JiTT questions

ConceptTest data



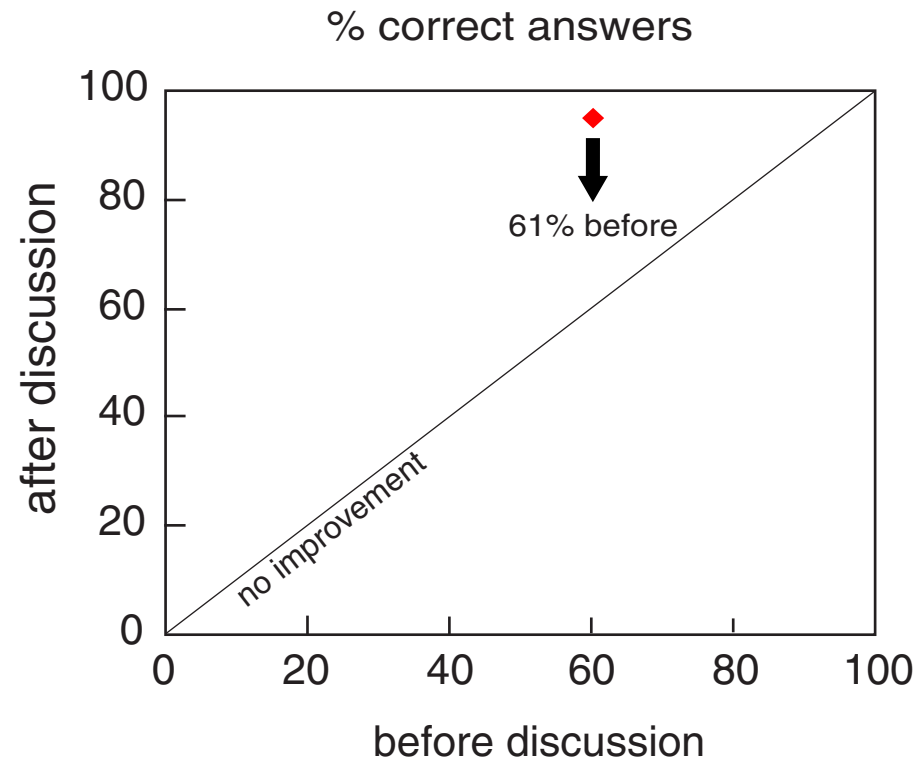
Developing PI/JiTT questions

ConceptTest data



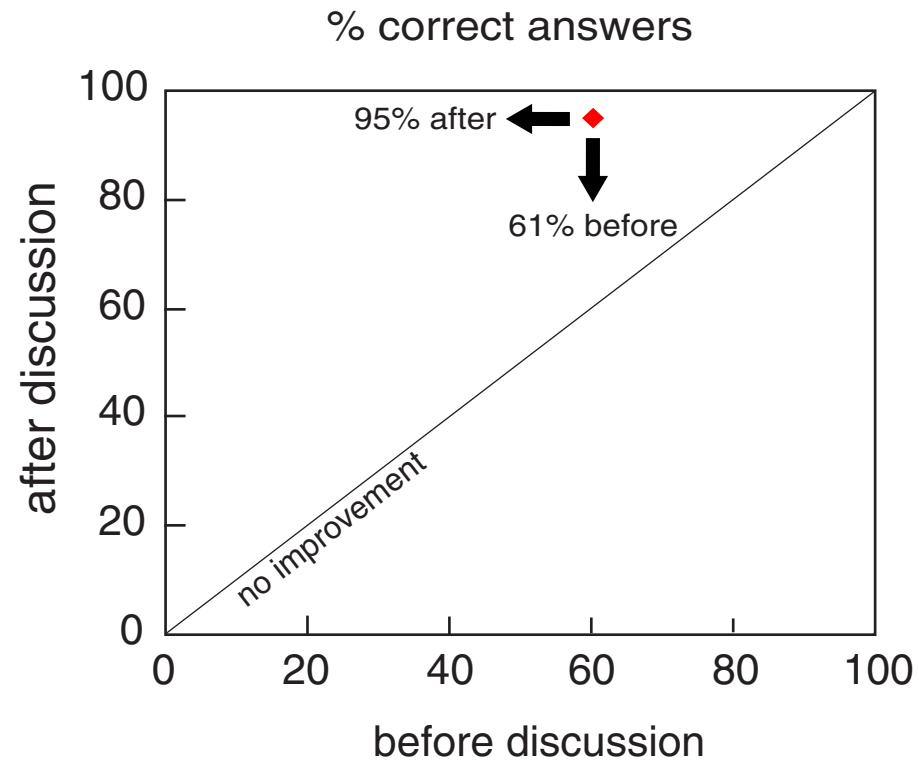
Developing PI/JiTT questions

ConceptTest data



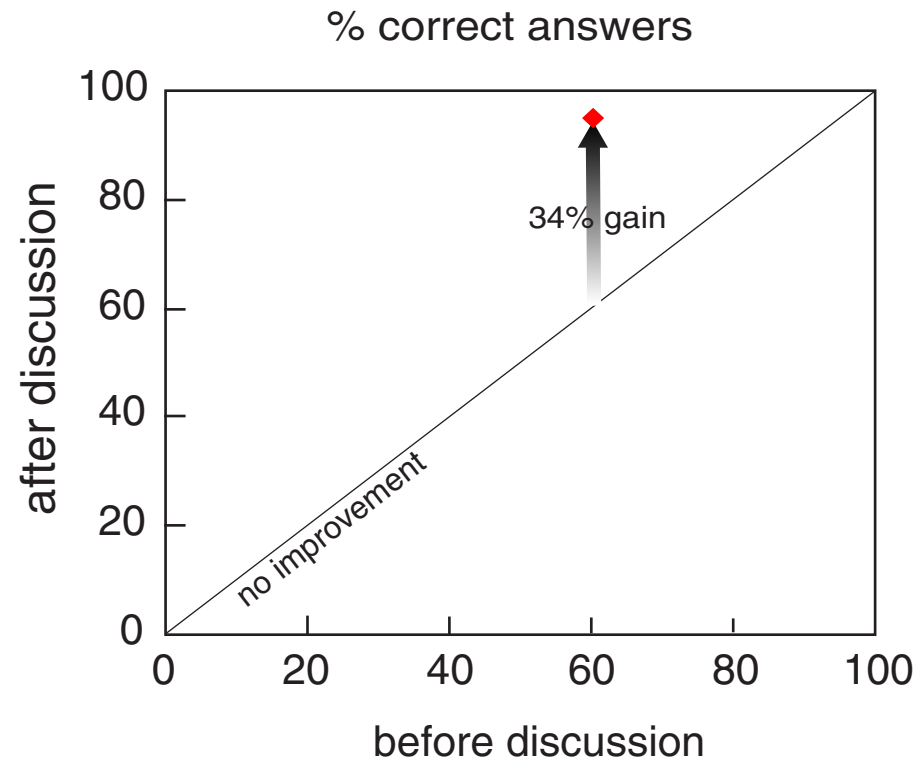
Developing PI/JiTT questions

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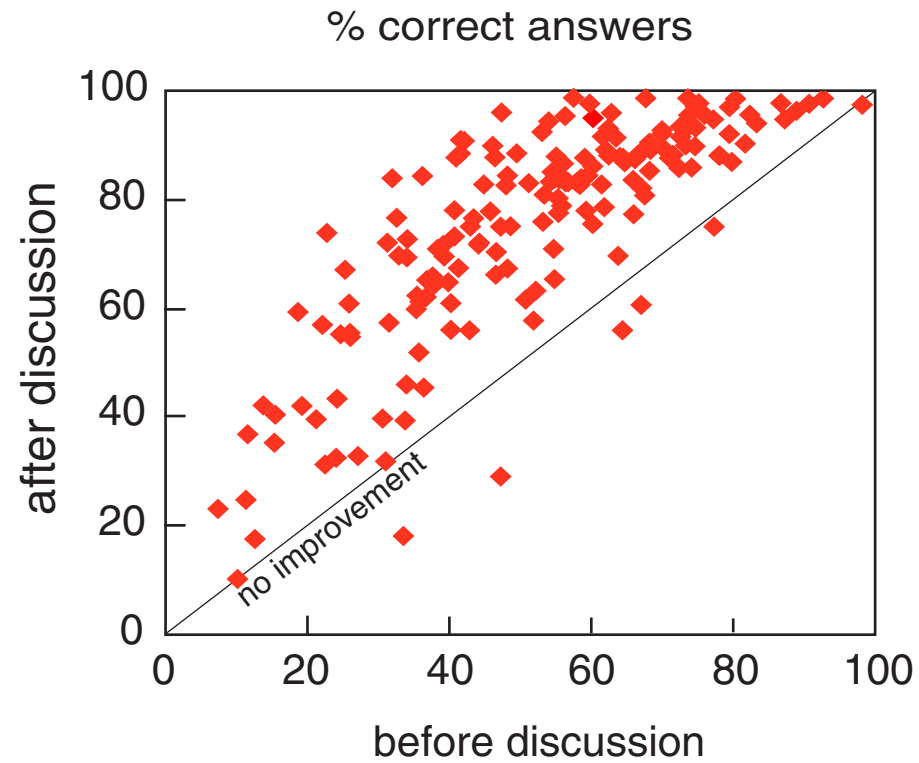
Developing PI/JiTT questions

ConceptTest data



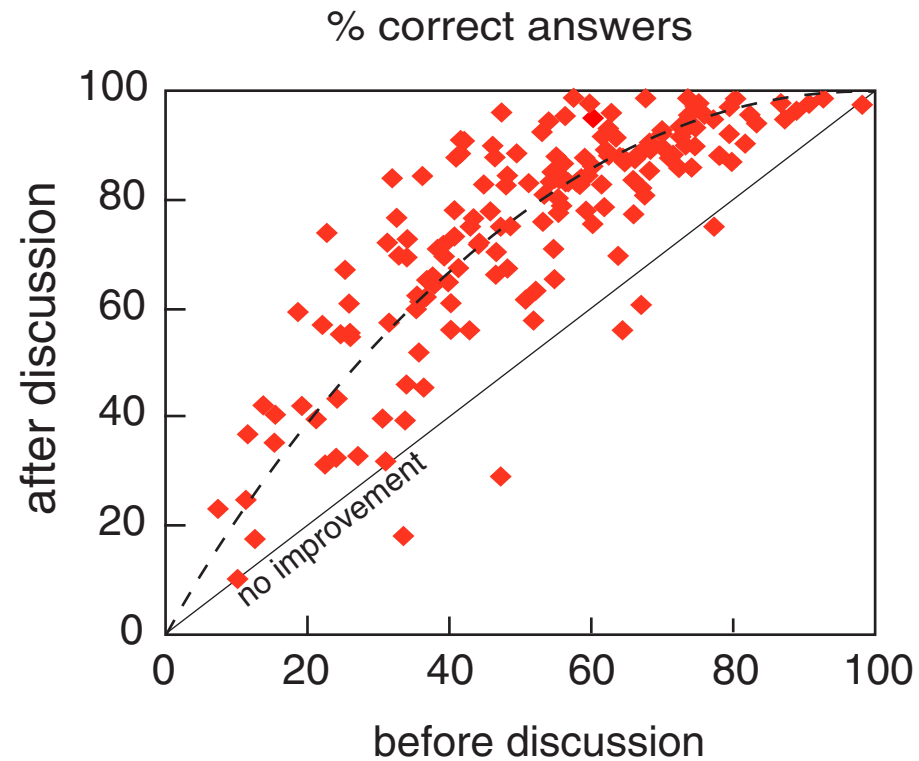
Developing PI/JiTT questions

ConceptTest data



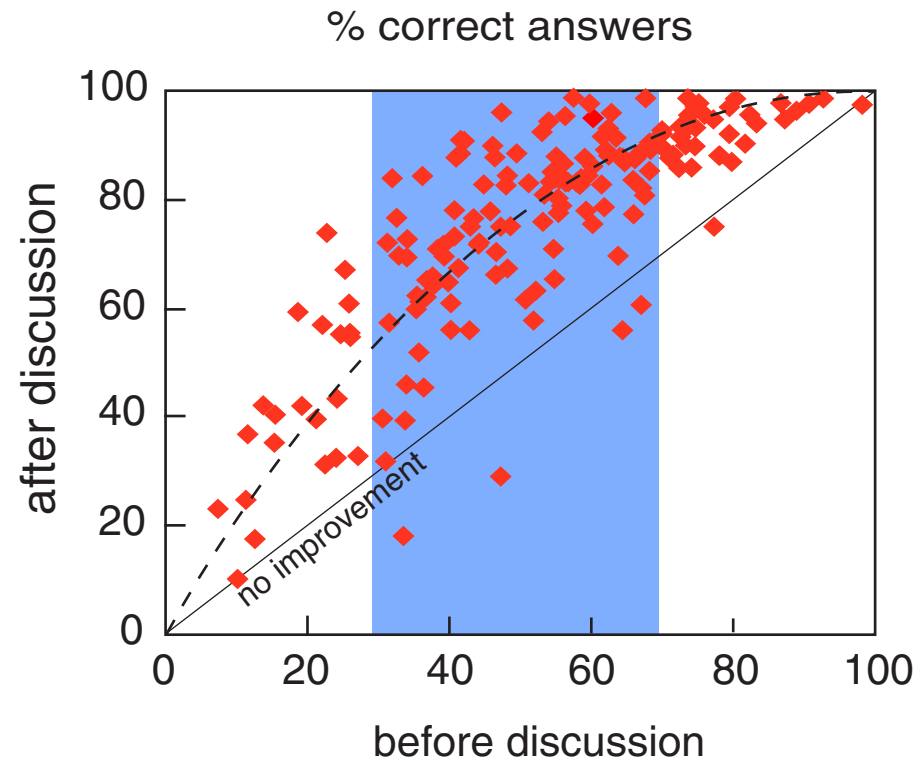
Developing PI/JiTT questions

ConceptTest data



Developing PI/JiTT questions

ConceptTest data



Developing PI/JiTT questions

“Can Conceptest be used in any discipline?”

*“Where to find good samples of ConcepTests in the area of
Management & Organisational Behaviour?”*

*“How can I find ConcepTests relating to
electrical and electronic engineering?”*

Outline

- **Your questions**
- **Developing PI/JiTT questions**
- **Strategies for assessment**

Strategies for assessment

“As we try to engage students in active and thoughtful learning, it is hard to evaluate accordingly.”

Strategies for assessment

Some ideas:

- **Open book/computer**
- **Collaborative exam**
- **Multidimensional**

Strategies for assessment

“Is it efficient to include peer evaluation as a way to complement Peer Instruction?”

Strategies for assessment

“Is it efficient to include peer evaluation as a way to complement Peer Instruction?”

Calibrated Peer Review: <http://cpr.molsci.ucla.edu>

Strategies for assessment

YouTube:

“Assessment: The Silent Killer of Learning”

Last, but not least...

Are you going to be implementing PI/JiTT?

Last, but not least...

Are you going to be implementing PI/JiTT?

Share your plans!

Research Funding:

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