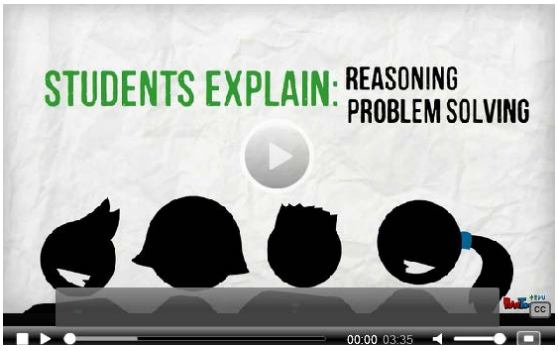
R·I·T

TEACHING ELEMENTS
PEER INSTRUCTION

VERSION 1.0 | 7/3/14

WHAT IS IT?

Are you interested in exploring ways to motivate students to attend class and to engage them more deeply in the content during class?



Peer Instruction, a structured teaching practice that requires students to examine their own and their classmates' reactions to and analysis of the content, is a simple yet effective way to engage students. Rather than simply lecturing and having a discussion, the instructor periodically asks students to consider a carefully designed "concept" question, related to known areas of common confusion or misunderstanding. Students take a few minutes to formulate their answers to these questions and then work in small groups to arrive at consensus. This group discussion often results in students explaining the concepts and providing clarifications to their teammates who may have answered it incorrectly at first (hence the name of the practice, Peer Instruction). Full class discussion, guided by the instructor, takes place as a final step providing additional modeling of concepts and further clarification as needed.

WHAT IS THE EVIDENCE PEER INSTRUCTION HAS A POSITIVE IMPACT ON LEARNING?

Research in the effective use of the Peer Instruction has shown that the practice:

- Increases students' conceptual understanding and traditional quantitative problem solving in the math and science disciplines (Crouch & Mazur, 2012).
- Supports better retention of knowledge. "Peer-instructed students who've actively argued for and explained their understanding of scientific concepts hold onto their knowledge longer" (Lambert, 2012, para 10).
- Increases course satisfaction and retention for students (Crouch, Watkins, Fagen, & Mazur, 2007).
- Increases student engagement. Eric Mazur, professor at Harvard University and a pioneer of the practice, suggests that students often seem more comfortable seeking guidance from their peers, as compared to pursuing clarification from the instructor, and therefore engage in the course at a higher level when there is the opportunity for peer instruction (Simon & Cutts, 2012).

PEER INSTRUCTION IN ACTION

The following are some of the typical steps involved in the Peer Instruction method. These steps may be modified based on the unique needs of the course or students. These steps are preceded by the instructor designing the concept questions.

1. Students individually consider the concept question. You may consider using clickers to allow students to anonymously report their answers. Students are typically given 2-3 minutes to form their response.
2. Students work in a small group (3-4) to discuss their individual answers to the question and to arrive at consensus on the "correct" answer. In order to reach consensus, students must explain their own reasoning and problem solving in support of their answer. Groups are given adequate time to discuss, debate, and "peer instruct" one another.
3. After the group discussion, students are then asked to answer the question a second time, individually. Again, clickers can be used.
4. The entire class participates in discussion led by student explanations of their group's findings, and the instructor clarifying or modeling as needed.

For more detailed information see:

Developing Concept Questions

Facilitating Peer Instruction

WHERE CAN I LEARN MORE?

Books:

- Mazur, E. (1997). Peer instruction: A user's manual. Upper Saddle River, NJ: Prentice Hall.

Video:

- Interactive Teaching, produced by Harvard's Derek Bok Center for Teaching and Learning.

Articles:

- Crouch, C. H., Watkins, J., Fagen, A.P., & Mazur, E. (2007). Peer instruction: Engaging students one-on-one, all at once, in *Research-Based Reform of University Physics*, edited by E. F. Redish and P. J. Cooney (American Association of Physics Teachers, College Park, MD, 2007), Reviews in PER Vol. 1, http://www.per-central.org/document/ServeFile.cfm?ID=4990
- Lambert, C. (2012).*Twilight of the lecture*. *Harvard Magazine*. (March-April). Available online at http://harvardmagazine.com/2012/03/twilight-of-the-lecture
- Simon, B., & Cutts, Q. (2012). Peer instruction: A teaching method to foster deep understanding. *Communications of the ACM*, *55*(2), 27-29. doi:10.1145/2076450.2076459

Websites:

- http://mazur.harvard.edu/education/educationmenu.php
- https://www.peerinstruction.net/about
- http://www.peerinstruction4cs.org/

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Crouch, C. H., & Mazur, E. (2001). Peer instruction: Ten years of experience and results. *American Journal of Physics, 69*(9), 970.

Crouch, C. H., Watkins, J., Fagen, A.P., & Mazur, E. (2007). Peer instruction: Engaging students one-on-one, all at once, in *Research-Based Reform of University Physics*, edited by E. F. Redish and P. J. Cooney (American Association of Physics Teachers, College Park, MD, 2007), Reviews in PER Vol. 1, http://www.per-central.org/document/ServeFile.cfm?ID=4990

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Simon, B., & Cutts, Q. (2012b). Peer instruction: A teaching method to foster deep understanding. *Communications of the ACM, 55*(2), 27-29. doi:10.1145/2076450.2076459