# Using E²Coach to Encourage Peer-to-Peer Learning

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What is E²Coach?

E²Coach (Electronic Expert Coach) is a website that delivers personal advice for how to succeed in a course to students. This system was implemented with large lecture classes in mind as they are the ones in which students get less individual attention. The information that the system uses to tailor specific messages to students is gathered primarily through surveys in the system.
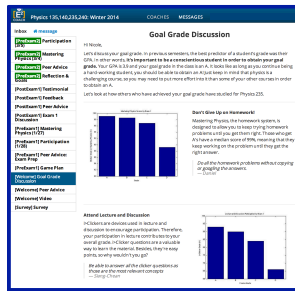
Peer Advice

Hi Nicole,

Don't Lose hope! Go over what you got wrong and talk to someone about how you should have done/approached those problems. Switch up studying techniques if you think that will help. As you learn the new material, you now have a sense of how it might be turned into an exam question – so keep those thoughts in the back of your head as you go along.

You can try to streamline your studying process by incorporating test preparation into your usual habits. Build up your study guide each week, make quick summaries of your notes, label your homework with the topics covered in the problems, and make note of concepts and problems you struggled with. Then when the test comes around, you don't need to remake study material for the ideas you grasped and you can spend time revisiting and practicing the concepts that you had trouble with. And if you feel on top of things, offer to help others. Teaching and speaking through explanations is often rewarding and is an efficient way of solidifying ideas in your own mind.

-Blythe

Research performed in the school of public health shows that people are more likely to follow advice if the advice comes from their peers[1]. Therefore, most of the advice we deliver on the system comes from previous students who have taken the course. These were originally only Science Learning Center (SLC) study group leaders, but we have started requesting that students currently using the system provide advice for future students.

Results
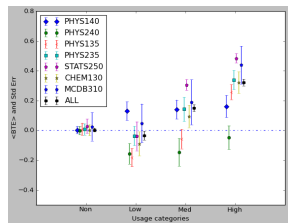
E²Coach is a voluntary system with better students being more likely to use it. Therefore, to test its effectiveness, we compared students coming from a similar academic background using a BTE score: $BTE\ (G_{actual}, GPA) = G_{actual} - G_{pred}(GPA)$ High-users, those who visited more than 5 weeks during the semester, had significantly higher BTE Scores.
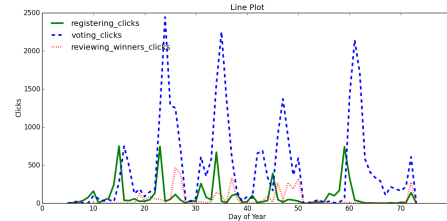
## Tournaments: Peer Review in an Upper Level Physics Course
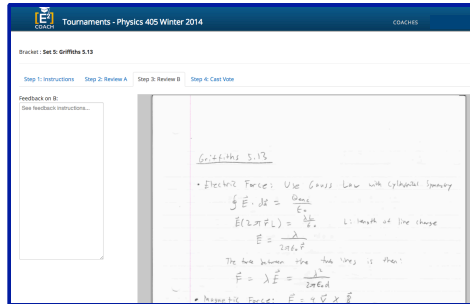
The tournaments, a learning tool offered through E²Coach, enables students to anonymously rank the work of their peers. Students submit a pdf of their work to the system by a given date. Once the homework is submitted, the students then are asked to compare the work of two of their peers, leaving comments on why they ranked one higher than the other. They make this head-to-head comparison three times. They are then shown the rankings along with the comments. The homework in this course is offered as extra credit. The students who are ranked in the top third get a little more credit than the middle third who get more credit than the bottom third.

Tournaments Usage

Because the system is online, we can observe how the students using it. Above, we can see from the voting clicks that students are taking the voting seriously, toggling between the two assignments that they're asked to vote on. Traditional homework only allows us to review our own work or the professor's solutions, but here, we see that students are taking the time to review the winners of the tournaments, their peer's work. Below, we see that as time goes on, there's a general trend of fewer students using the system and a large drop in the number of students leaving comments. The comments are not part of their grade, which helps inform us that something needs to change in the motivation to leave comments.
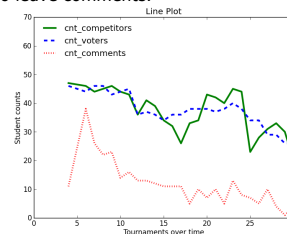
Results

One of our main questions that is yet to be fully answered is how well can students, who are still learning the material themselves, identify the correct answer and accurately grade their peer's work. Below is shown a plot of tournament ranks vs. grade. We see that there is a weak correlation. Part of why there may not be a stronger correlation is that many of the students get the correct answer on the homework, so it's difficult to rank based on accuracy alone.
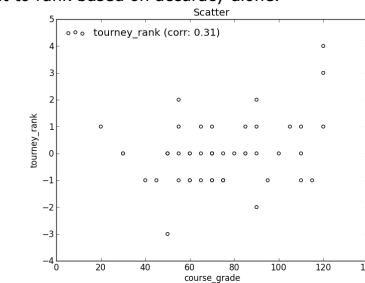
Acknowledgments & References

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1. Strecher, V. J., Shiffman, S., & West, R. (2005). *Addiction*, *100*(5), 682-688.