Does Peer Instruction enhance students understanding in Europe?

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Rationale
Many studies show the great efficiency of Peer Instruction as a collaborative learning strategy. However, most of these studies have been done in American or English universities (T. Vickrey et al. 2014), and literature about the success of PI in European universities is very uncommon.

PI is distinguished because the students construct their knowledge through dialogue with peers (Mazur, E. 1997). Europe and the United States have distinct cultures. This makes the class an international environment with different behaviours. In particular, European students are considered more reserved than their American counterparts.

This study analyzes the success of peer instruction methodology in the EPFL’s context, oriented towards the possible cultural differences.

Method
The study consisted in two items: An in-class study of peer discussion’s impact on student understanding and a survey to know their perception of the technique.

In-class study:
We use clicker questions to measure the effect of peer discussion on student understanding. For this, we use pairs of questions dealing with the same concepts and with the same level of difficulty (called Isomorphic questions by Smith et al. 2009). They allow us to measure the effect of the teaching technique.

We compare two different teaching techniques, each time applied to the whole class: a typical explanation from the teacher (Control) and the Peer Instruction (PI) strategy.

The experiment has been conducted in a General Chemistry bachelor course, during the spring semester 2015. It consists of 7 PI and 4 Control pairs of questions, during 5 weeks with 60 to 120 answering students.

Survey:
At the end of the study we carried a survey in order to analyze students perception of the techniques. We received answers from 108 students.

Results
Does PI enhance student understanding? Our analysis shows a clear increase in student understanding after each peer discussion. However it reveals no significant difference between peer discussion and teacher’s explanation (p-value > 0.1). Our results, both from the quizzes and the survey, confirmed that the concept questions allow them to better understand the content of the course.

Does European shyness affect PI discussions? On a panel of 108 students questioned, 64% do not consider that it is easy to discuss with other students they do not know. Only a few of them (14%) actually discuss the questions with people they do not know.

We also discovered that the students were often naturally discussing during the control session. While this mitigates our results, this also shows that clicker sessions create by themselves an environment of mutual emulation.

Implications
- No significant difference between PI and teacher’s explanation.
- Conceptual questions allow students to be more attentive during lectures.
- Students are prone to naturally discuss with their friends during clicker quizzes.

References

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