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Project Title :	Peer instruction with Students' Response System (SRS): Using mobile devices as students' response systems to transform large classes into an interactive learning environment
Leading University :	The Hong Kong Polytechnic University
Participating UGC-funded University(ies) :	The Chinese University of Hong Kong
Project Leader(s) :	Dr Kevin Hin Wang Chan, Department of Applied Social Sciences, The Hong Kong Polytechnic University

Layman Summary of Proposal

More and more researchers and educators underscore the efficiency of knowledge transfer through active participation of students. However, the increasing number and size of large classes, resulting in fewer opportunities of in-class interactive activities in the higher education sector, pose new challenges for more effective learning. With the aim to engage students in a large class context, the current project advocates the promotion of active learning through peer instruction, a pedagogy in which students discuss and learn from each other in a flipped classroom context. Facilitation is conducted through a students' response system, i.e. using electronic devices such as smart phones and tablets to enable students to answer questions and receive feedback instantly in class.

Peer Instruction Model by Eric Mazur
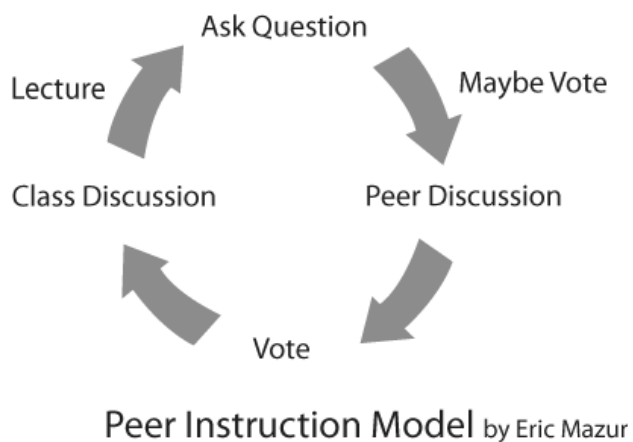
Peer instruction, pioneered by Professor Eric Mazur and the Mazur Group at Harvard University, emphasises the active participation in class through discussion on questions requiring understanding of underlying concepts in a small group setting. Lectures are interspersed with conceptual questions based on common misconceptions of students.

In large peer instruction classes, identification of such misconceptions is attained by referring to the student responses in the students' response system. Clarifications of concepts are achieved through processes of asking questions and formulating answers.

Peer instruction provides opportunities for peer learning when students discuss the reasoning behind arriving at their responses, particularly in a controlled setting where students who are above average in class are assigned to assist their classmates.

In the proposed three-year span, the interactive pedagogy of peer instruction with the adoption of SRS will be introduced at participating institutions, The Hong Kong Polytechnic University (PolyU) and The Chinese University of Hong Kong (CUHK). The PolyU lead team has assembled 27 teachers from five faculties (Health & Social Sciences, Business, Engineering, Humanities, and School of Hotel & Tourism Management) in over 10 subject areas across all levels of study (i.e. Year 1 to 4), of major and electives, and of various class sizes (i.e. 20 to 400 students). The Centre for Learning Enhancement and Research (CLEAR) will represent CUHK as one of the partners of the project. Around 15 collaborators on the teaching front from four faculties (Medicine, Business Administration, Social Science, and Arts) at CUHK are anticipated to participate in the project.

Training on peer instruction will be provided by our international collaborative partner, Professor Eric Mazur from Harvard University. The training will be delivered through live online classes at the initial stage of the project, with a follow-up lecture and workshop organised at PolyU. In the second year of the project, the project team will visit the Mazur Group at Harvard University, sharing experiences on the implementation of peer instruction, as well as seeking advice on challenges that may be encountered.

To successfully promote the pedagogy of peer instruction in large classes, SRS technology will be utilised to expedite the in-class discussions. The project will adopt an existing proprietary students' response system used by PolyU (i.e. the Turning Point system) and a home grown students' response system (uReply) developed by CUHK (Lam, 2013) for SRS administration.

Layman Summary of Final Report

Project Objectives:

To meet the challenges of engaging and motivating students in large classes at institutions in Hong Kong, this project will look at how peer instruction, with the assistance of a student response system, can provide a sustainable solution to this important issue.

Project Activities:

The project team organised a series of activities for the dissemination of the interactive teaching and learning approaches:

1. Organising workshops on student response system and peer instruction.
2. Launching online teacher and student tutorial materials on wikispace.
3. Video demonstration of peer instruction on YouTube Channel.
4. Updating the project news through the bi-monthly project newsletters.
5. Organising annual team gathering to exchange new ideas in teaching and learning, and the development of teaching and learning technology.
6. Developing the home grown student response system, uReply.
7. Developing the authentication system for uReply with the PolyU Single-sign-on architecture.
8. Developing the Learning Management System (LMS) integration of uReply.

Project Outcomes:

The cumulative frequency of students engaging in clickers activities at PolyU has reached over 30 000 students. More than 130 teachers have adopted SRS in their classes respectively. Over 2 500 sessions of SRS have been launched in over 400 classes. For CUHK, between the period of September 2015 and December 2017, over 250 teachers adopting SRS in their classes, with over 2 500 SRS sessions conducted.

18 teachers at PolyU implemented the pedagogy of peer instruction in their classes. Sessions of peer instruction were conducted in over 25 classes, with 6 000+ students benefited from the pedagogy. In CUHK, there were 10 teachers incorporating the pedagogy of peer instruction in their teaching.

Project Impact:

1. Publications: In verifying the effectiveness and efficiency of SRS and peer

instruction, the project team submitted several academic papers and conference proceedings to contribute more empirical and substantial evidence to the pedagogical advancement.

2. International award: The project team obtained the Bronze Award at the QS Reimagine Education 2016 in the category of "The Best Use of ICT Tool". Media coverage can be found through the links below:

- Ming Pao
- Sing Tao
- Ta Kung Pao
- Wen Wei Po

3. Community of Practice (CoP): The project team disseminated knowledge, good practice and development of skills in the adoption and application of SRS and peer instruction in blended learning practices through the CoP platform.

4. Affiliation with the Higher Education and Development Society of Australasia (HERDSA): Promoting best practices and direction for advancing peer instruction with SRS in the higher education sector through HERDSA.

5. Guidance policy facilitating the adoption of peer instruction with SRS in large classes: Many teachers are expected to adopt peer instruction with SRS in their classes under the guidance policy endorsed by the Learning and Teaching Committee, which requires substantial active learning components (more than 30%) in lecture time.