Day 2 Symposium

SS-01

Teaching chemistry in Hong Kong classrooms

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This symposium aims at demonstrating the role of multiple representations, namely, the marco, submicro and symbolic representations, in daily chemistry teaching in Hong Kong. The symposium is research-informed and practice-oriented. By being research-informed, the papers will report some practices of Hong Kong chemistry teachers in the light of current chemical education literature – particularly on the role of the triplet relationship (Gilbert & Treagust, 2009) and the role of visualization in chemistry teaching and learning (Gilbert, Reiner & Nakhleh, 2008). By being practice-oriented, these papers will report how ideas in the literature are realized in a context in which there is a prescribed official curriculum for all students, curriculum time is limited while the content is massive, textbooks predominate students' expectation of how they are taught, all students will take a high stake school-leaving public examination in which teachers are, in one way of another, held accountable for the examination results.

The first paper addresses some strategies that the author used in facilitating students' understanding of the role of different representations in learning chemistry. She will demonstrate (through videos of her own teaching) a way students' learning of stoichiometry, which is traditionally conceived by students as algorithmic problem solving, can be facilitated by the use of diagrammatic representations of submicro phenomena. They way she emphasizes the triplet relationship as a recurrent theme in the teaching of the whole chemistry course in senior secondary level (Grades 10-12) will be explored. Students' work and feedbacks will be reported.

The examination administering body (Hong Kong Examinations and Assessment Authority) publishes exam reports that describe students' performance in each subject. These reports and corresponding seminars attract the attention of teachers. It was especially the case in the school year 2011-2012 when Hong Kong held the first public examination for the new senior secondary school structure. In the second paper, the chemistry examination paper will be analyzed in the light of the idea of meta-visualization (Gilbert 2005, 2008). The authors will argue how an emphasis on the use of students' mental visual representations can potentially facilitate students' meaningful learning of chemistry while improving students' performance in public examinations.

The third paper focuses on strategies that deal with textbooks' mis-representations of scientific inquiry, i.e., how macro phenomena should be approached. Instead of reinventing the wheel by creating scientific inquiry tasks for students from scratch, which is not likely to be realistic, the authors would illustrate how they modified textbooks that facilitated students' acquisition of inquiry skills.

The last paper report a research project that investigated students' mental visual representations of metallic bonding and the malleability of metals. Implications for teaching, learning and the design of diagrams will be discussed.

Given the research-informed and practice-oriented nature of this symposium, speakers will not only include a science education researcher, but also Hong Kong teachers teaching in different schools whose students' capability ranges from the highest to the lowest. Targeted audience includes science educational researchers who are interested in hearing the voice of schools teachers, graduate students and school teachers.

References

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