

Global Chinese Conference on Computers in Education (GCCCE) 2010

Tutorial Proposal

1. Tutorial title:

Enhancing Collective Inquiry-based Science Learning through Modeling and Visualisation Technologies

2. Presenter name(s) & contact information (email, telephone).

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3. Tutorial format: Hands-on and seminar (6 hours)

4. A brief tutorial outline for website publication (About 200 words)

Modeling has been promoted by major policy organisations as an important approach for science learning. This tutorial is based mainly on two modelling projects in Singapore. For the project *Modeling and Visualisation Technologies to Promote Inquiry-based and Student-centred Science Learning in Secondary Schools*, the research team focused on three MVT studies involving Chemistry (Speed of chemistry reaction), Physics (Electricity), and Biology (Genetics) (<http://www.nie.edu.sg/nienews/feb09/14-1.html>). The follow-up project, which is the ongoing project, is the *Sustaining and Scaling up Inquiry-based and Modelling and Visualization Technology Integrated Science Learning (MVT II)*. It focuses on developing design guidelines for sustaining and scaling up technology-based innovations using modelling and visualisation technologies and inquiry-based science teaching and learning in Singapore schools. There are now four schools and 29 teachers in Chemistry, Biology, and Physics collaborating in the project (<http://www.nie.edu.sg/nienews/dec09/14-1.html>).

The tutorial will first provide an overview of the two projects to show the importance of an iMVT pedagogy. Then participants will have opportunities to select from a list of iMVT tools and curriculum materials in Chemistry, Biology, or Physics to have hands-on experience. The tutorial will conclude with small group and all-participant discussion to summarize strategies for introducing, sustaining, and even scaling up such pedagogy in different countries and schools.

5. Intended audience: Schools teachers, master or Ph.D. students, and/or Researchers. (Maximum number of participants: 30).

6. Prerequisites: No.

7. Attendee Requirements: We will work in a computer-lab. Handouts will be provided. No need to bring anything.

8. Presentation language: (English is the language, but the presenters are also fluent in Chinese)

9. Presenter Requirements: Yes, a computer-lab with permission to install some free software tools. Standard equipment 1024x768 projector is needed; we will bring our own laptop for presentation purpose.

10. Presenter bio(s) (one paragraph, about 200 words).

The presenter, Dr. BaoHui Zhang, is a faculty researcher at the Learning Sciences Lab and an Assistant Professor in the Learning Sciences and Technologies Academic Group at the National Institute of Education (NIE), Nanyang Technological University in Singapore. He is a former high school chemistry teacher and a chemistry teacher educator at Beijing Normal University in China. He worked as a postdoctoral fellow at LRDC at the University of Pittsburgh and at Carnegie Mellon University for a year (2003-2004) after receiving his Ph.D. His last position before joining NIE was an education researcher at Michigan State University. Along with other NIE and international researchers, his most recent projects focus on using modeling, visualization and/or mobile technologies to promote student-centered and inquiry-based science learning in Singapore schools. Dr. Zhang has published a number of papers and book chapters on student learning with technologies and science teacher education. He also has had rich academic exchange experiences. BaoHui Zhang received his Master of Education degree from Beijing Normal University in 1994. He received his Master of Science degree in 2002 and Ph.D. from the University of Michigan in 2003.

The presenter, Dr. Foong See Kit, is an associate professor at the Nature Science and Science Education Academic Group at the National Institute of Education (NIE), Nanyang Technological University in Singapore. In physics education, Dr. Foong is interested in inquiry approach to the teaching and learning of physics, demonstrations of concepts in physics, expositions of topics and misconceptions in school and undergraduate physics, and the development of physics experiments and demonstrations. His collaborators include teachers, MOE officers, and members of Physics Education Group, University of Washington. In physics content research, he is interested in theoretical physics (quantum theory and quantum field theory) and interdisciplinary physics (wave propagation, physics of sports and biophysics).

The presenter, Ms. Ye Xiaoxuan, is a research staff at the Learning Sciences Lab, National Institute of Education (NIE), Nanyang Technological University in Singapore. She received her Master of Education degree from Beijing Normal University in 2009 and completed her thesis on the pedagogy of Nature of Science. She is now working with Dr. Zhang on the project focusing on modeling, visualization and technology enhanced inquiry-based and student-centered science learning in Singapore schools, and her major responsibility in the project is the development of curriculum materials that integrated the iMVT innovative pedagogy.

The presenter, Ms. Chia Peichun, is a research staff at the Learning Sciences Lab, National Institute of Education (NIE), Nanyang Technological University in Singapore. She holds a Bachelor of Arts degree from the National University of Singapore in 2008 with a major in Psychology. In the same research project as Xiao Xuan, she provides assistance to the Principal and co-Investigator in creating a community of practicing teachers of the iMVT-integrated pedagogy from the four collaborating schools.

Ms. Lyna Kwan is a research fellow at the Learning Sciences Lab, Singapore

11. Additional notes for reviewers: N/A