Mathematics Teachers Conference 2008

Abstracts of Concurrent Workshops

Secondary

S1 – Teaching mathematics through problem solving for lower secondary grades
by Prof A. Takahashi (DePaul University, USA)

Abstract: Secondary Mathematics Syllabus (Ministry of Education Singapore, 2006) emphasises that the students should have opportunities to discover, reason and communicate mathematics by engaging in stimulating discussions and meaningful mathematical activities. This means that the process of learning mathematical contents is as important as the acquisition of concepts and procedures. The National Council of Teachers of Mathematics suggests that problem solving is one of the important processes for teachers to facilitate during mathematics lessons in order for students to engage in discussions and activities. This hands-on session will provide participants with opportunities to learn how to help students learn mathematics through problem solving. The participants will experience a variety of problem solving activities and open-ended approaches that can be useful resources for designing lessons using problem solving.

S2 – Innovate to Keep Problem Solving Alive! by Prof. Catherine Vistro-Yu (Ateneo de Manila University, Philippines)

Abstract: We, teachers, sometimes run out of ideas and have difficulty creating new problems for our students to solve. When those times come, the remedy is to innovate on existing and old problems that have proven to be useful and effective in teaching mathematical skills. In this workshop, participants will be given some pointers on how to innovate on "used" problems with the objective of developing "new" problems to give to students. For the most part, participants will be innovating on existing or old problems that will be given at the workshop. They will also be encouraged to share the results of their work as well as their personal reflections on this aspect of problem solving.

S3 – Some heuristics for problems in school geometry
by Mr Chua Puay Huat (MME/NIE)

Abstract: In this workshop, different methods of solving problems in school geometry will be discussed. In illuminating some of the heuristics, emphasis will be made on understanding the underlying mathematics rather than merely applying algorithms. How such questions in school geometry may contribute to producing better assessment of learning and how problem solving behaviour can be encouraged in the classroom will also be discussed.

S4 – Teaching geometrical problem solving
By Mr Leong Yew Hoong (MME/NIE)

Abstract: Geometrical problem solving in school usually involves at least three related components: solving the problem diagrammatically, writing the solution steps in a logical order, and providing warrants. Each of these components will be examined in the workshop and ways to integrate them in geometry teaching will be discussed.

S5 – Students' concept image in problem solving
by Mdm Teo Soh Wah (MME/NIE)

Abstract: The workshop will walk participants through some investigation on types of concept images students use when they solve problems. Any erratic component of students' concept images could cause them to form an inappropriate belief and use some inappropriate intuitive rules to solve problems. They may commit errors in problem-solving due to their inappropriate belief and use of

wrong intuitive rules. The role of concept image in problem solving will be discussed. Some research findings will also be shared.

S6 – Integrating open-ended tasks in the lower secondary mathematics lessons
By Dr Joseph Yeo Kai Kow (MME/NIE)

Abstract: This workshop will assist lower secondary mathematics teachers to examine the techniques and processes of integrating open-ended tasks or problems for their lower secondary pupils. It will also discuss the rationale for introducing open-ended tasks in the classroom, the process of designing open-ended tasks and illustrate some examples of solving open-ended tasks. Teachers will also be given the opportunities to assess samples of pupils' open-ended task solutions.

Target Group: All Lower Secondary Mathematics Teachers

S7 – Mathematical Problems for the Secondary Classroom

by Jaguthsing Dindyal (MME/NIE)

Abstract: This workshop is intended for all secondary school mathematics teachers. The first part of the workshop will focus on some criteria for selecting, modifying and writing problems for use in the secondary mathematics classroom. The second part of the workshop will address the issue of using problems in the assessment of students' problem solving skills and in their learning of mathematics.

S8 - Using e-Actvities for Problem Solving

by Mr Paul Poh Tze Thiam & Dr Soon Yee Ping (MATHLODGE)

Abstract: This workshop aims to share with the participants how to create an e-Activity on the graphing calculator Casio fx-9860G SD/Slim for learning and problem solving. All the mathematical functions available in the fx-9860 G SD/Slim graphing calculator can be integrated easily into the e-Activities, hence make the e-Activity a versatile and useful tool for learning and problem solving. In particular, graphing calculators are generally accepted in secondary school and junior college mathematics classrooms. With the built-in e-Activity, they also provide a cheaper and portable alternative to computers. Participants will have hands-on experience in creating an e-Activity during the workshop and no prior knowledge of the graphing calculator is required. More explorations on the use of e-Activities for teaching and learning will also be demonstrated.