Following up on technology and mathematics teaching

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1. Introduction

This issue of the Electronic Journal of Mathematics and Technology is the second and final special issue that comes out of the ICME 12 Topic Study Group 18 on technology and mathematics teaching. The group aimed at providing a forum to discuss the current state of art of the presence of technology in diverse aspects of teaching mathematics conveying a deep analysis of its implications to the future.

The Topic Study Group had 42 contributions and more than 80 participants. The topics addressed were diverse but evolve around the use of technology in the classroom practice, design and use of digital teaching materials, Technology in teacher education, Distance education and the use of learning management systems.

This special issue contains four papers. The first paper “Elementary Pre-service Teachers and the Internet: Perceptions and concerns” by Ji-Won Son and Qingtong Hu reports from a study of preservice teachers evaluations of online math teaching resources made by seventy-six preservice elementary teachers. Their study also explored the challenges preservice teachers perceive integrating internet-based resources.

In the second paper "How teachers can use TI-Nspire CAS with laptops in an upper secondary course", Per-Eskil Persson explores how teachers can use TI-Nspire CAS software. He focusses on possible changes in teachers' classroom practice and attitudes around technology for mathematics learning. The results show how TI-Nspire software can be used in regular education in courses at upper secondary level. Persson shows that the involved teachers developed their skills and attitudes during the study, both in terms of management of technology in mathematical work, and when it came to integrating it into a high-quality learning environment. His study suggest a positive impact by the use of technology on students’ view of mathematics.

In the third paper "Cognitive workload and mathematics instructional design for non-users of mathematical software applications" Liew Kee Kor and Jacqueline Bee-Peng Chuah investigate the cognitive workload of students working with printed Maple commands in the learning of Calculus. Randomly selected students completed a worksheet and the questionnaire after each lesson in a course. They show interesting results about the relation between sex, cognitive workload and ability level. The worksheet based teaching method was found to be successful.

The last paper “Computer Algebra System (CAS) Usage and Sustainability in University Mathematics Instruction: Findings from an International Study” by Daniel Jarvis, Chantal Buteau, and Zsolt Lavicza reviews the sustained use of Computer Algebra Systems (CAS) in university instruction. They take outset in a Canadian national survey that indicates that many professors are using CAS in their instructional practice, and that the greatest factor influencing the use of CAS in one’s post-secondary mathematics teaching is the use of CAS in one’s own research. and continuous to describe how two departmental case studies in the United Kingdom and Canada indicates that a sustained implementation at the departmental level is very complex and requires dedicated staff with influence as well as a strong and shared incentive for change. Significant challenges to implementation are also found and discussed.